FEBRUARY 18, 1952 NEWS ISSUE

Electrical World

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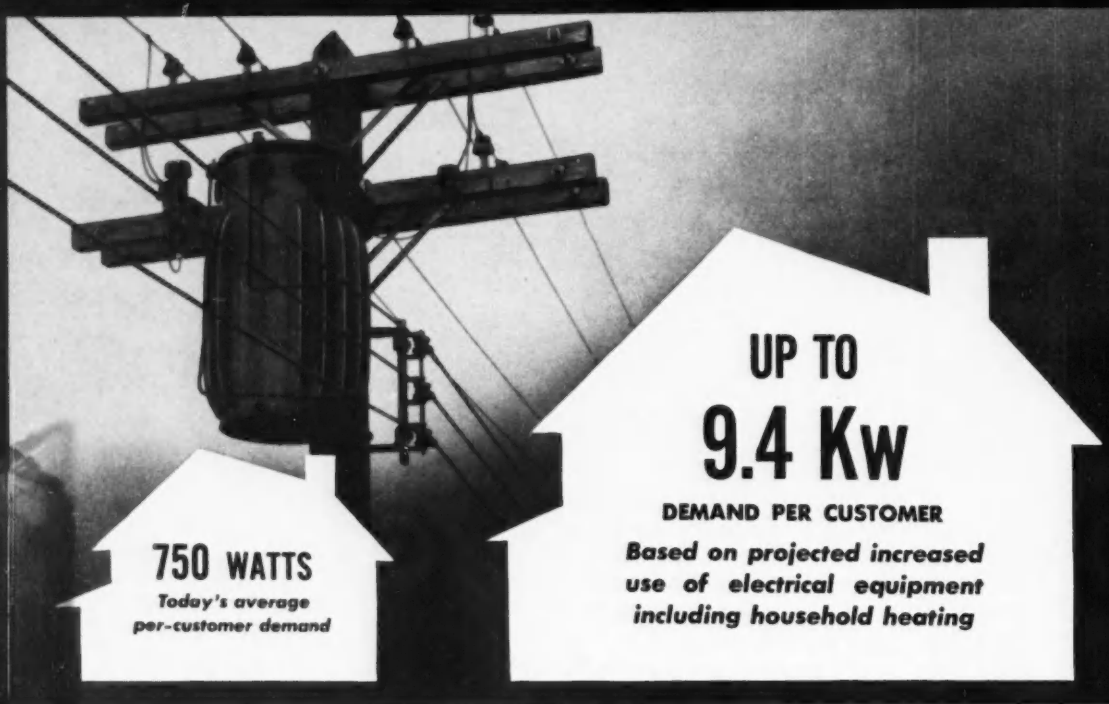
Henry B. Sargent: after a merger, head of new Arizona Public Service....Page 7

Making Transformers Is a Slow Job . . . Page 20

Wages Will Rise in '52 . . . Page 50


750 WATTS
Today's average per-customer demand
UP TO
9.4 Kw
DEMAND PER CUSTOMER
Based on projected increased use of electrical equipment including household heating

What happens to present secondaries when domestic demand multiplies 12½ times?

Even with customer demand up to 9.4 kw, No. 2 conductor will be adequate, say G-E engineers. Here's a pattern for the future

With the steady rise in residential demand and the prospect of even greater increases due to heat pump and other loads, it's natural to ask: How adequate are today's secondaries for the growth that lies ahead?

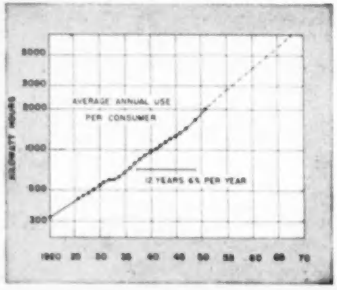
Will tomorrow's demands call for a wholly new type of secondary distribution and the sacrifice of today's very considerable investment?

In the great majority of cases, according to an analysis by General Electric engineers, present single-phase 120/240-volt secondaries, using No. 2 wire, are fully adequate for the maximum loads that can now be foreseen, even with saturation of water heaters, ranges and electric heating.

Increasing demands can be handled by adding more transformers and by using progressively larger size transformers and shorter secondaries. This is true right up to the point where a 75-kva transformer, overloaded 50 per cent, is needed to feed one span of 125 feet each way with four customers per pole—equivalent to a per-customer demand of 9.4 kw or 12½ times the present average of 750 watts.

Today's residential secondary systems are planned on a sound economic footing. The industry is ready for all that the future may bring. General Electric Co., Schenectady 5, N. Y.

TODAY'S POLE-MOUNTED TRANSFORMER averages 16.9 kva—according to G-E shipment statistics—more than double the average 1947 unit rating of 8.3 kva. Above, the trend to larger units is checked by D. K. Blake, Power Transmission and Distribution Engineering Div., and J. L. Elrod, Marketing Mgr., Distribution Transformer Dept.



PROJECTION FOR THE FUTURE shown in chart is based on steady rise in domestic kw-hr consumption over the past 30 years. Today's 750-watt demand is estimated on 1951 average usage of 2000 kw-hr.

MORE POWER TO AMERICA

GENERAL ELECTRIC

301-188

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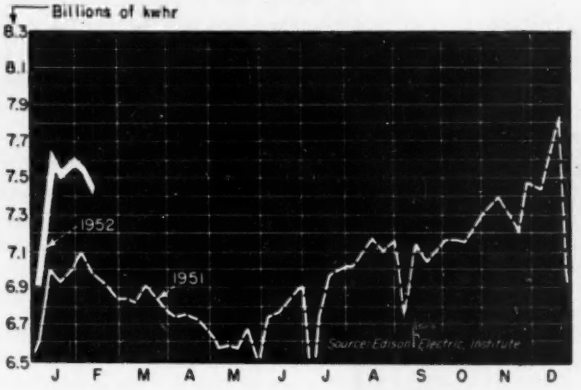
February 18, 1952 Electrical World



Output Week Ended Feb. 9—7,455,509,000 Kwhr

Per Cent Change From Previous Year

	Total US	New End.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Feb. 9	+7.2	+3.8	+4.5	+6.9	+6.0	+ 7.5	+21.8	+ 7.8	+ 4.2	+7.8
Feb. 2	+6.7	+3.4	+5.3	+5.1	+6.0	+ 9.8	+19.4	+ 4.5	+ 1.9	+6.3
Jan. 26	+9.3	+6.2	+6.7	+6.8	+9.9	+10.8	+19.2	+10.9	+11.3	+12.1

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load—Class I Utilities (Million Kw)	Dec.	67.85*	65.95	60.03
Capacity (Million Kw)	Nov.	75.18	74.68	67.98
Production (Billion Kwhr)	Nov.	32.10	32.44	29.02
Hydro		8.08	7.55	7.67
Fuel		24.02	24.89	21.35
Sales (Billion Kwhr)	Nov.	27.92	27.68	25.39
Residential		7.37	6.85	6.41
Commercial		4.68	4.65	4.21
Industrial		13.89	14.13	12.95
Other		1.97	2.05	1.82
Fuel Consumption				
Coal (Million Tons)	Nov.	9.72	9.58	8.76
Oil (Million Barrels)		5.95	5.44	6.20
Gas (Billion Cu Ft)		53.70	72.00	47.76
Net Income Class A & B Utilities ($ Million)	Nov.	70.81	54.02	65.27
Dec. 52 Peak Class I Utilities (Million Kw*)	Nov.	77.7	77.4	69.9
Kwhr per Residential Customer (12 Month Average)	Nov.	1,988	1,972	1,813
Revenue per Kwhr Residential Service (12 Month Average)	Nov.	2.82¢	2.83¢	2.89¢
Canadian Production (Billion Kwhr)	Nov.	4.94	4.92	4.46

Business Statistics

FBR Industrial Production Index†††	Dec.	216*	219	216
Gross National Product Annual Rate ($ Billion)	4th Qtr.	330.0	327.6	303.7
E. W. 5 Industry Production Index	Jan.	125.5	125.0	120.1
ENR Construction Cost Index††	Feb.	115.1	114.8	112.5
BLS Consumer's Price Index	Dec.	189.1	188.6	178.8
NEMA Insulation Materials Sales Index†	Dec.	466	511	564
NEMA Electric Appliance Sales Index	Dec.	218	269	364
NEMA Household Refrig. Sales Index†	Dec.	115	87	219

* Estimated † 1936 = 100 †† 1949 = 100 ††† 1937–39 = 100 (Unadjusted)

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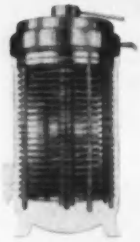
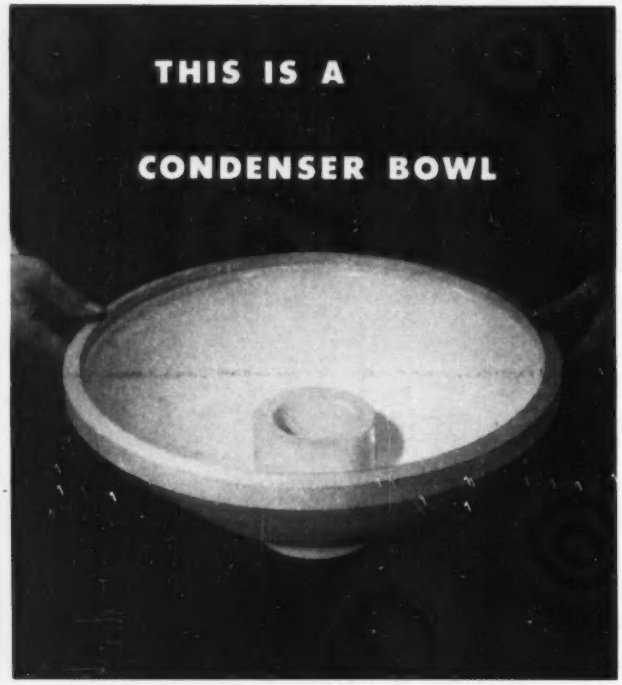


It has an electrical and a mechanical duty to perform. It insulates and supports the rotor assembly for a pressure-gas-filled condenser, a Lapp product widely used in radio broadcast and other high-voltage, high-current, high-frequency circuits.

The requirement for low loss at radio frequencies—to keep down heating which would limit voltages and frequency at which the condenser could serve—dictates the use of a steatite body as ceramic for this bowl.



Maintenance of the dimensional tolerances required for such a piece presents a formidable challenge to the producer of a steatite body. Excessive warpage and variable shrinkage—in one direction as compared to the other—are traditional "bugs" in steatite—due to the form of the long flat scales which is the nature of the structure of steatite.

However, Lapp has pioneered in the production of steatite pieces of such size and shape. In fact, during World War II, a large production facility for such pieces was readily made available at Lapp, and throughout the war all requirements which we heard about were met.

It's a long way from a gas-filled condenser or an airplane antenna entrance insulator to a 69Kv line insulator or a sectionalizing cutout housing. Yet we of Lapp take the same order of pride in each. For all represent the same accomplishment—a device soundly designed and skillfully produced to do its job efficiently and dependably. It's an accomplishment which arises from detailed technical knowledge of the ceramic body, its characteristics and strengths, through which have been perfected advanced production and control techniques. The result is insulators, and insulating parts, of porcelain, or special ceramics, which offer an extra margin of operating security. Users of electrical porcelain may say it: *"Although you can buy cheaper porcelain—you can't buy better porcelain—than Lapp."*

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

THE ELECTRICAL WEEK

Featured in this issue

New Arizona Public Service to develop frontier with a future (p 7) . . . President Truman has and/or plan for development of the St. Lawrence (p 9) . . . **Dale E. Doty's** nomination to FPC raises question of Interior's future influence there (p 10) . . . NPA is using **"calculated" slippages** (p 14) . . . MSA plans more electric power for Western Europe (p 16) . . . It takes a long time to make a transformer (p 20) . . . **Wisconsin-Michigan** uses a diversion canal to solve a tricky river development problem (p 28) . . . SEC takes its fight for jurisdiction over **Washington Water Power** sale to U. S. Circuit Court of Appeals in San Francisco (p 43) . . . Wages will rise in '52 (p 50).

• • •

Washington—House appropriations subcommittee has completed hearings on budget request of Interior Department and could bring the bill to the floor by March 1 . . . **REA spokesmen** went before another House subcommittee last week to make a bid for its fiscal 1953 funds . . . **Tar Heel Electric Membership Corp,** an association of 27 North Carolina electric co-ops, is stepping up its activities. Plans call for opening an office in Raleigh and hiring a full-time, well-paid executive . . . FPC issues license to **Public Utility District No. 1** of Pend Oreille County, Wash., for its 15,000-kw Box Canyon hydroelectric project.

Federal government's Grand Coulee and Bonneville plants on Columbia River in 1951 exceeded for the first time the output of government's other large power system, TVA, registering a total of 17.7 billion kwhr.

Brazos River Conservation and Reclamation District directors instruct officers to proceed immediately with negotiations to complete a contract with Texas P&L for sale of power from Turkey Creek, Inspiration Point, Cordova Bend hydroelectric dams the district plans to erect.

Union Light, Heat & Power announces it will place in effect in northern Kentucky on Feb 18, an increased electric and gas rates to yield $688,000 yearly. It will be covered by a bond pending any further action.

Boston Edison's 1951 taxes were at a record high of $17.2 million—equivalent to $6.96 per common share or over 23¢ per dollar of revenue. Dividends were but $2.80 per common share in 1951.

National City Bank, in its February monthly letter, says: "Granted that there is need for more electric generating capacity, the tax-paying, investor-owned utilities, where ready and willing, should be permitted to provide it. Instead, the Federal government is in some instances actually blocking the efforts of private utilities to build new power facilities and is insisting on carrying out, itself, the development with taxpayers' money."

Omaha Public Power District, Nebraska, advises it has topped Narragansett Electric's meter readers, who have worked 908,424 man-hours without a lost-time accident. (EW, Jan. 21, p 5). On Dec. 24, 1951, the meter department of the District, which includes readers, testers, and installation men, completed 25 years without a single lost-time accident. During this period, there were 1.2 million man-hours of work performed and 1.6 million miles traveled by personnel of this department. Can any other company top this record?

In Western Massachusetts Electric's territory about 2,000 new homes were built in 1951 with 86% of owners selecting electric ranges and 95% electric refrigerators. Electric cookery is now used by 32% of total residential customers on the system, the company reports. The utility promotes the sale of appliances but it does not merchandise them.

A useful pamphlet, "Wages in a National Emergency . . . the why and how of wage stabilization," is now available, free, from any office of Wage Stabilization Board.

California Electric Power is first utility to reline its penstocks and pipelines with cement mortar. Linings extend life and restore original flow conditions.

To keep pace with Florida's fast growing population, Florida P&L directors were told that company engineers estimate they will be called upon to spend $332 million on plant expansion during the next ten years. Of this amount, $22.1 million has been estimated for 1952 and $27.8 million for 1953, Pres McGregor Smith reports.

Cleveland Electric Illuminating Pres Elmer L. Lindseth told Public Utility Buyers Group of National Association of Purchasing Agents in Cleveland: "Annual expenditures for construction and operation purchases at the average electric utility often amount to as much as 75% of annual sales. Purchases equivalent to 50% of sales are commonplace. Under these circumstances, the purchasing department may be responsible in one year for as much money as the electric utility pays out in employee wages and benefits in two years . . . and as much as it nets in income in three or four years."

Congratulations—Minnesota Mining & Manufacturing promotes Louis F. Weyand from vice president to executive vice president and names George W. Swenson and Hubert J. Tierney vice presidents . . . Minnesota Mining & Manufacturing International elects vice pres Clarence B. Sampair as president, succeeding Robert W. Young, who becomes chairman . . . Edison Pioneers elects Irving E. Moultrop, Belmont, Mass., president.

Obituary—Morris E. Leeds, 82, founder and chairman of the board of Leeds & Northrup Co., makers of electrical instruments, automatic controls, and furnaces, died Feb. 8 at Lake Wales, Fla.

THE ELECTRICAL WEEK

CONTINUED

Pacific G&E announces purchase of 137-acre site on Humboldt Bay three miles south of Eureka, Calif, for construction of long-rumored steam plant (EW, Feb. 11, p 71). First unit will be 40 Mw, and duplicates can be added without structural modifications.

Aluminum Co of Canada is experimenting at Yarrows, Ltd., Victoria, on construction of aluminum towers to be used for 50-mi. 287-kv line, from its powerhouse being constructed at Kemano to smelter site at Kitimat.

Tacoma, Wash., City Council adopts ordinance granting about 6% pay hike to 400 members of International Brotherhood of Electrical Workers, AFL.

Because of scarcity of critical materials, meter output may drop below 75% of 1951 volume, committees on metering and service of Association of Edison Illuminating Companies and Edison Electric Institute were told last week in Birmingham, Ala., as NPA was carefully screening requests for meters.

More Congratulations—Public Service Co of Oklahoma names H. S. Kilby, formerly vice president of Western L&T in Kansas, assistant to president.

IN THE INDUSTRY

After watching the electric utility industry fight countless battles without the support of others who claim to be believers in the American free-enterprise system, it is heartening to see the support the five companies are getting in their battle to redevelop the Niagara.

From coast to coast, from border to border other industries, professions, labor, and the press have rallied behind the cause of free enterprise, represented by five New York electric utilities. These are Niagara Mohawk Power Corp, Rochester Gas & Electric Corp, New York State Electric & Gas Corp, Central Hudson Gas & Electric Corp, and Consolidated Edison Co.

Three Bills Before Congress . . . These companies want to redevelop the Niagara River at their own expense. The Capehart-Miller Bill now before Congress would let them do just that. But the Ives-Cole Bill would have New York State do the job, financed by tax-free revenue bonds. And the Lehman-Roosevelt Bill would allow the federal government to take over, using as always public funds.

Perhaps in no other public power-private power struggle has the issue been so clear. The Niagara project is a clear cut power project. There are no side issues such as flood control, navigation, or irrigation. As the medical societies of Oneida, Herkimer, and Madison Counties of New York said in an editorial in the January issue of their magazine:

"The issue is basic and fundamental not only to the entire structure of American economy but also to the structure of the private life of individual Americans . . . including doctors, dentists, and nurses."

Capehart-Miller Bill Gets Support . . . Those who favor the private companies are rallying around the Capehart-Miller Bill. They include such organizations as the New York State Association of Electrical Workers, the New York State Brotherhood of Locomotive Firemen and Engineers, the New York State Grange, Pomona Grange, No. 4, of Vermont, the Empire State Association of Commerce, the New York City Federation of Women's Clubs, and the American Medical Association.

The significance of the Niagara project has been realized by the press of the nation which often favors public power. It is known that papers in 17 states, some as far off as Texas and California, have carried editorials favoring the Capehart-Miller Bill.

Naturally the investor-owned electric utility industry has gotten behind the five companies. Many of them are distributing the booklet, "More Power from Niagara," to their stockholders, employees and other groups. Copies of this booklet can be secured from Walter J. Thompson, More Power from Niagara, Niagara Falls, New York.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Apparatus clearances are occasionally inadequate for making such checks as phase rotation after a disrupted circuit has been repaired.

Thermal agitation accounts for the background noise commonly emanating from resistors used in communication; in the case of varistors the phenomenon is less at higher frequencies.

Varistors in series (like resistors) must have approximately identical characteristics if they are to divide the reverse voltage proportionately.

Silicone resin graduations on glass last longer, at least they do on clinical thermometers washed in soap and dipped in strong disinfectants.

Limit switches are probably safer if they are connected in the power circuit than in the control circuit.

Relays are available to trip street lighting circuits that have been accidentally disrupted.

Spreader stokers are reportedly capable of burning low quality bituminous effectively and efficiently, even at high rates of heat release.

Lightning outages on 230 kv are 80 to 85% from strikes to conductors and 15 to 20% to towers. The latter can be reduced by high insulation levels and low tower-footing resistances.

Third circuit out of a growing substation will hardly add what it should if the first two have not been separated well enough so that either can be worked on without de-energizing the second for purpose of safety.

BIGGEST SINGLE LOAD BUILDER on lines of Arizona Public Service is the irrigation pump. More than 90% of the state's tillable farm land would quickly become arid wasteland if not irrigated. Drought and more farm acreage upped '51 pumping sales to 259,151 Mwhr

New Arizona Public Service Co Serves Frontier with a Future

Rapid growth in population and industry of 5th largest state in area means better business for the company formed by merger of Central Arizona Light & Power Co and Arizona Edison Co

(See Front Cover)

A new utility company, Arizona Public Service Co, will begin operating March 1. By then it is expected that the Federal Power Commission will have approved the merger of Central Arizona Light & Power Co and Arizona Edison Co, both of Phoenix.

Public Service will have more than 110,000 electrical customers in a 37,000 sq-mile territory. Some 90,000 other customers will subscribe to its other services: natural gas, domestic water, sewer, butane gas, telephone, or steam.

But it is the electrical system that will draw the major portion of Public Service's business. In 1951 the two companies sold 907,845,000 kwhr. Industrial customers took 219,829,000 kwhr, and commercial sales were 243,861,000 kwhr. Residential customers bought 185,004,000 kwhr. Average annual usage by the customers of Calapco and its subsidiary, Northern Arizona Light & Power Co, was 2,112 kwhr. Arizona Edison's customers used a little less, 1,835 kwhr.

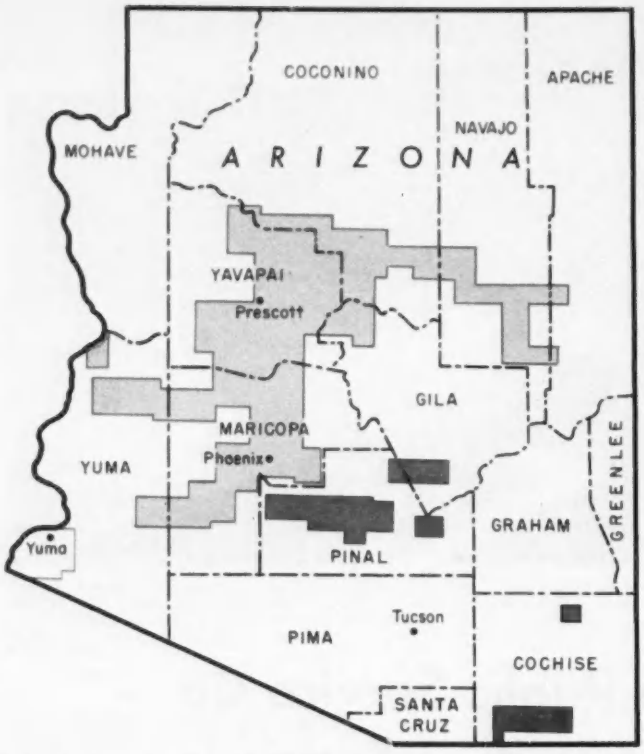
The biggest sales classification was irrigation. These customers took 259,151,000 kwhr. The estimated pumping load last summer was better than 46,000 kw. Parker Dam plant supplied 36,000 kw. Of this 30,000 kw was furnished under a contract made solely to secure power for irrigation.

Calapco and Nalapco had a peak load of 198,000 kw in 1951. Arizona Edison's peak was 44,000 kw. It is not known, nor believed, that these peaks were coincidental.

Public Service lists its capacity at 325,000 kw. The company's own major plants have a capability of more than 190,000 kw. Some small plants add 13,600 kw. The remainder of the company's power supply is provided by firm power contracts with the Arizona Power Authority, the U. S. Bureau of Reclamation, and the Salt River Valley Water Users Association. The company's scattered service areas are also interconnected by lines of federal agencies.

A 200,000-kw, outdoor, gas-burning power plant will be erected in southern Pinal County, in the Casa Grande area. The first 100,000-kw unit is scheduled for operation in the spring of 1954 and the second a year later.

Public Service has closely identified itself with Arizona, the fifth largest state in the Union in land area. The company will serve 10 of its 14 counties. "Serving the frontier with a future" is the company's slogan. There may be some doubt as to whether the state can still be considered on the frontier. There is less doubt as to its future judging by its past progress.



TERRITORY served by Arizona Public Service includes light-shaded territory of Calapco and Nalapco and dark-shaded areas of Arizona Edison Co which also serves Yuma and suburbs

Second Fastest Growing State . . . In the past decade population rose from 499,000 to 750,000. By many other indices of growth the state also ranked high: Second in income growth, first in percentage increase of retail sales, first in farm and ranch income growth, second in increase of bank capital, third in increase of bank deposits.

For many years Arizona depended primarily on the Big C's: copper, cotton and cattle.

Its $205-million copper output led the nation in 1951. The demand for copper will boost output still more. Extensive operations at the San Manuel copper mine, east of the company's new power plant in Pinal County, and at the Bagdad mine and smelter, west of Prescott, will boom two areas of the state. If present negotiations are successful, both developments will be served by Public Service. This will add about 45,000 kw of load.

Other mining is also increasing. New discoveries of uranium, principally in the northeast section of the state, have increased output of that vital metal. Production of tungsten and manganese also is being reactivated. There are also many nonmetallic mineral products.

Cotton is still the state's leading agricultural product. It makes up more than 42% of the annual agricultural income of over $300 million. For the past two years the yield per acre has led that of all other states. Livestock and animal products accounted for 33%. The remainder came from lettuce, citrus fruits, dates, melons, carrots, feed grains, etc.

Manufacturing Gaining . . . Newcomers on the Arizona economic scene, manufacturing and industry, have gained prominence since the war years. For the first time the dollar value of manufacturing may in 1952 surpass the dollar output of mineral products. Last year manufacturing volume jumped to $175 million, with an attendant 33% increase in employment.

Arizona's fourth largest source of income is the tourist trade. Last year tourists and health seekers spent about $120 million for fun and relaxation.

Linking Public Service closely to the civic and business interests of the state is the company's board of directors. Of its 25 members 24 are Arizona residents, the twenty-fifth is from Colorado. Of the 13,000 stockholders, the majority live west of the Mississippi.

Henry B. Sargent, Calapco president, will head the new company. Sharing management's burdens will be these vice presidents selected from the personnel of both companies involved in the merger: A. H. Forman, Jr, L. K. Doutrick, F. T. Fahlen, Jr, George H. Groh, John T. Kimball, Douglas B. McGregor, and William P. Reilly.

TOURIST AND HEALTH SEEKERS invest about $120 million annually in Arizona. Sunshine is one of state's greatest assets. It has an average of 86% of possible sunshine hours

The Whole St. Lawrence, Or . . .

. . . a strategic retreat to save the project's power features is the crux of President's plan for U. S. participation

While still fighting for full U. S. participation in the proposed St. Lawrence Seaway Project (EW, Feb. 4, p 10), President Truman last week was preparing for a strategic retreat if that became necessary.

His line of action: Make plans for some sort of U. S. participation in construction of the power feature of the project if Congress fails to approve the navigational features.

Committee Appointed . . . To carry out this action, the President has appointed an inter-agency committee headed by Jack Gorrie, chairman of the National Security Resources Board. Other agencies represented on the committee include Federal Power Commission, Army Corps of Engineers, Office of Defense Mobilization, and Interior, State, and Commerce Departments. The group plans to meet with a counterpart Canadian committee in Ottawa.

Although Canada could conceivably build the navigation features of the project entirely in Canadian waters, this would be economically questionable without the power dam. And the dam would have to be built partly in U. S. waters. When President Truman offered his backing to an all-Canadian project, it was understood that he would do his best to clear the way for U. S. cooperation in building the power feature at Barnhart Island in the International Rapids section of the St. Lawrence.

No Timetable Set . . . President Truman has not set a definite timetable as to when Congress should act. His advisors say he wants to watch for a month or two and see what progress is being made. If prospects then seem dim, he likely will shift to the all-Canadian navigation project. By that time, too, he may be able to gauge whether Congress would approve participation in the power feature alone.

If Congress does sit on the overall project, there are two ways left open in which the U. S. might participate in the power plant construction.

The first of these ways would be to get Congress to authorize federal participation in the power feature. This would probably mean authorization and appropriations to the Army Corps of Engineers to construct the plant in cooperation with the Hydro-Electric Power Commission of Ontario.

The second way might possibly be taken without Congressional action. It would call for some backtracking on the part of the Administration and the Federal Power Commission. But if the President is desperate enough, he may rely on this method.

Could Grant License . . . This calls for FPC to grant a license to the New York State Power Authority to build the U. S. portion of the power project. It is known that the committee headed by Gorrie is giving a great deal of consideration to this plan, and this is bound to come up at the exploratory sessions of the Ottawa conference.

The New York Authority applied for a license several years ago to build the U. S. portion of the power project, but was turned down.

However, the authority took the decision to the U. S. Court of Appeals for the District of Columbia. By mutual consent hearings on it have been put off until after May 1.

This case could be withdrawn by the authority at any time before arguments are heard. In light of the latest White House action, it is conceivable that the authority may be asked to withdraw the case and resubmit an application to FPC. In this event there would be the tacit understanding that the Administration would support the application.

Spares the Trees

The helicopter shown above was used recently in the Malvern Hills of Hertfordshire, England, to lay a 1,250-ft power cable across a densely wooded valley. Object: to spare the destruction of hundreds of trees in the valley.

Linemen used 'copter to carry a stout cord across the valley. Men on the pylon are shown attaching the cord. After that, a winch pulled balloon wire across, and then the cable (EW, April 10, 1950, p. 96).

McGraw Electric . . .

. . . buys Pennsylvania Transformer Co in tax-free exchange of 155,000 shares of stock

McGraw Electric Co, Chicago, Ill., has acquired Pennsylvania Transformer Co. Contract negotiations have been concluded by the companies for carrying out a tax-free exchange of Pennsylvania stock for McGraw Electric stock. The exchange will require 155,000 shares of McGraw common stock; no cash is involved.

William E. Kerr, president of Pennsylvania Transformer, will continue to direct that company's operations as president and general manager. The other members of the management staff also will remain. Under present plans, the company will be operated independently of other divisions of McGraw Electric.

It is planned that Pennsylvania will supplement manufacture of transformers by Line Material Co Division of McGraw Electric with additional production of the larger sizes on which McGraw Electric has been short of production facilities. Pennsylvania builds transformers that range in size from 100,000 kva to 230 kv. It also makes step-type feeders, regulators, and regulating, furnace, unit substation, and distribution transformers.

Pennsylvania operates a plant at Canonsburg, Pa., which contains 1 million sq ft of floor space and is situated on 216 acres of land. The firm was organized in 1929 by Samuel Horelick and Kerr.

DALE E. DOTY: To fill the vacancy, Senate must decide whether to confirm an . . .

Interior Official for FPC

President's surprise nomination of Chapman assistant raises speculation as to what the man's stand would be

On the surface, it looked like an attempt by Interior Secretary Oscar Chapman to get a finger in Federal Power Commission's licensing pie. But underneath there was a question as to whether the move had anything more than Chapman's tacit approval.

Cause of the fuss was President Truman's quiet nomination of Chapman's long-time protege, Assistant Interior Secretary Dale E. Doty, to fill the vacancy on the five-member FPC. The nomination caught the electric power and natural gas industries, which are regulated by FPC, completely off-guard. Doty's name had never come up in the long list of commission prospects.

Chapman Representative? . . . It is public knowledge that Chapman has long tried to get FPC to reserve more hydroelectric sites for federal development. Could it be that the Interior secretary was about to send a personal representative to sit on the supposedly independent, semi-judicial commission?

Even Doty, himself, couldn't deny that it might appear that way—on the surface. Then he offered some observations that cast doubt on this being a Chapman plan:

> Doty's name was suggested to the President independently of Chapman, and the secretary was not called in on it until after the decision was made.
>
> At that time Chapman raised a token objection, arguing that Doty would be of greater service in his present position.
>
> Doty has been more of a middle-of-the-roader in interpreting laws applying to Interior and does not believe administrators should take undue advantage of the wide latitude sometimes allowed in carrying out statutes.

Intellectual Honesty . . . Besides these, said Doty, 'there is one quality I hope I can carry to the commission if I am confirmed—intellectual honesty."

Did that rule out his taking part in cases Interior is pushing before FPC?

"Yes," he said, "I don't intend to act on any case in which I have taken an active part during my service with Interior."

It's a Tough Question . . . But even though Doty strives to act completely independent of his present Interior connections, has his ten-year training period at Chapman's elbow conditioned him always to favor federal power at the expense of private?

Even his close acquaintances have a tough time answering the question. One termed Doty, "purely and simply a Chapman man, and he will find it very difficult to break away."

But a lawyer who has worked for electric utilities and known Doty for a number of years had this to say: "You don't have to worry about Dale being a Chapman stooge on the commission. He is a solid level-headed, student-type fellow."

Joined Interior in '39 . . . Except as an Interior official, Doty has had little contact with private business. He joined the department in 1939 soon after receiving an M.A. degree from the University of Cincinnati. After a short tour of duty in the field, he came to Washington as an in-service trainee. By 1943 he had moved up to become an administrative assistant to Chapman, was then an assistant secretary.

In July of 1946, he followed Chapman, who was then made under secretary. Doty served as Chapman's special assistant. When Chapman became secretary, he appointed Doty assistant secretary for land management. At one time or another, he has had all of the bureaus and offices of the department under his supervision.

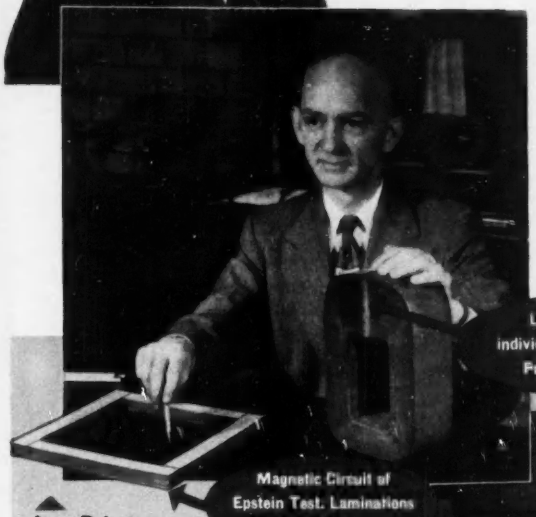
Doty's Next Worry is confirmation by the Senate. He recalls that he had absolutely no trouble in being confirmed as assistant secretary of Interior. There was only one question asked: Had the two Senators of his native California approved the appointment? His old friend and chairman of the committee, Joseph O'Mahoney, Wyoming Democrat, answered that one in the affirmative.

It's likely there will be more questions this time.

"There are Good Metallurgical and Design Reasons for the Low Exciting Current and Low Core Loss of the POLE STAR,"

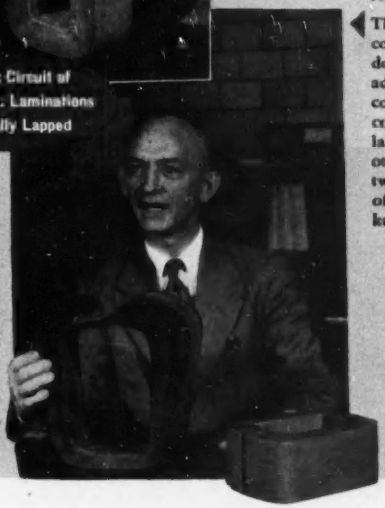
says Clarence J. Witsberger, *Electrical and Metallurgical Engineer*
PENNSYLVANIA TRANSFORMER COMPANY
Member ASTM Committee A6 on Magnetic Properties

Modern distribution transformers are fabricated of preferred oriented grades of cold reduced silicon steels. It is desirable therefore to take full advantage of the high permeability and low loss characteristics of this fine grade steel. This is accomplished in the Pole Star core design.



Laminations individually lapped in Pole Star core

Magnetic Circuit of Epstein Test. Laminations Individually Lapped



Low Reluctance at Lap Joint Results in Low Exciting Current

A minimum reluctance at the joint of the Pole Star Core is achieved by lapping the individual laminations. This is the same type of lap joint used in the magnetic circuit of the latest approved method for testing the permeability of preferred oriented cold reduced silicon steels. This test is known as the 25 cm. Epstein Test for core loss and permeability. The Pole Star core achieves a low exciting current by combining High Permeability Steel with a low reluctance joint.

Absence of Adhesions in Core Results in Low Core Loss

The core is carefully annealed in controlled-atmosphere furnaces, but does not suffer the disadvantages of adhesions. That is because in the core assembly process—when the core is built into the coils—the laminations are separated from each other. The absence of adhesions between laminations and the presence of high interlamination resistance keeps the core loss at a low value.

Pennsylvania

TRANSFORMER COMPANY
CANONSBURG, PENNSYLVANIA
Greater Pittsburgh District

FOR BETTER PERFORMANCE...

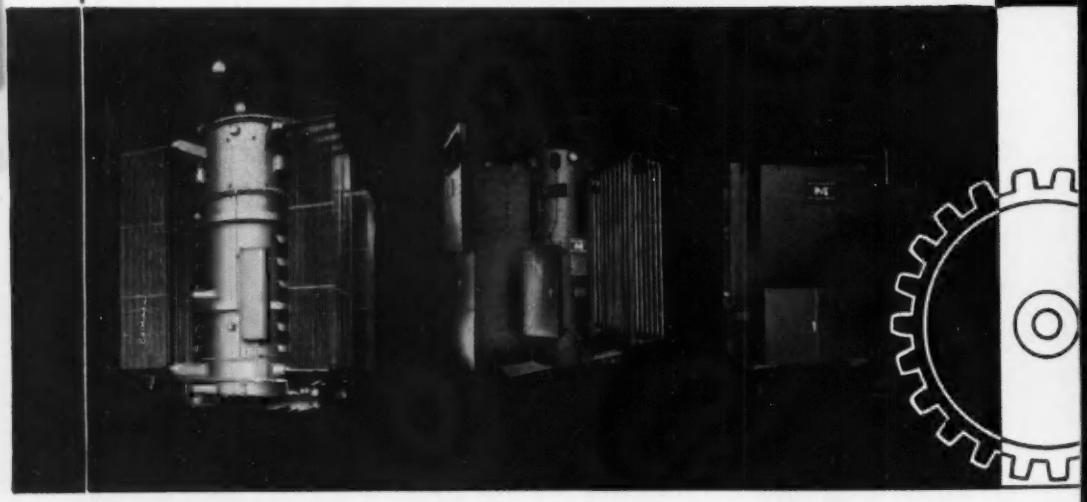
at the flick of a switch...
specify MOLONEY

IT is the modern miracle of electricity that enables man to operate everything from a toaster to a transportation system . . . by a flick of a switch. At your fingertip is the *power* to start . . . or stop the whole of America's industry. This *power* . . . from source to use . . . is regulated, transmitted and distributed with the aid of the transformer. Of necessity a transformer must be dependable . . . that is why the name Moloney is synonymous with the word transformer.

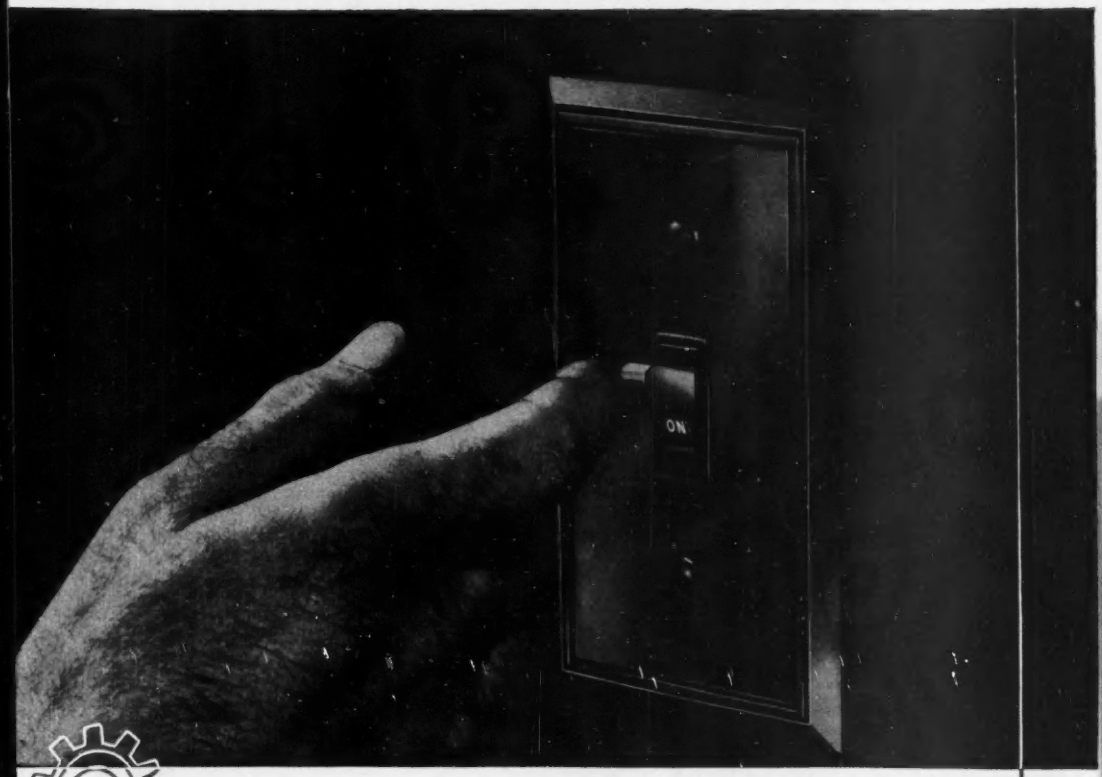
For Better Performance . . . Specify MOLONEY.

MOLONEY ELECTRIC COMPANY

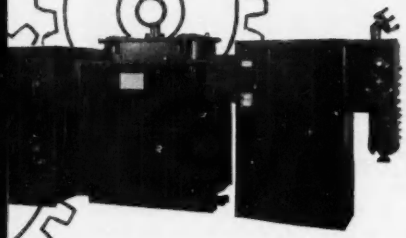
St. Louis 20, Missouri

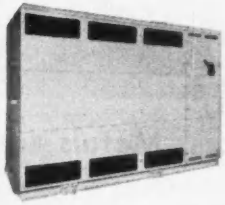


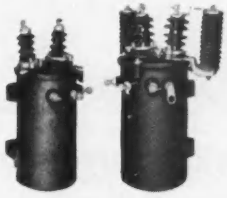
FACTORIES AT ST. LOUIS 20, MISSOURI AND TORONTO, ONTARIO, CANADA



Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control Transformers Step Voltage Regulators • Unit Substations







BETTER PERFORMANCE
GREATER RELIABILITY
LESS MAINTENANCE

SALES OFFICES IN ALL PRINCIPAL CITIES

NPA's Calculated Slippages . . .

Agency permits wire and brass mills to accept first quarter orders above supply of raw materials

National Production Authority now is playing around with calculated slippages in the delivery of wire and brass mill products. This means that the controls agency is permitting, at least temporarily, these mills to accept first quarter orders above the refined copper available to fill the orders.

For the utilities it means that delivery of the products covered by first quarter allotments may be delayed well into the second quarter.

For the first quarter, NPA is permitting wire and brass mills to accept authorized controlled material orders to the extent of 122% of their current directive for acceptance and scheduling of orders. Purpose of this action is to allow all first quarter authorized orders to be accepted and scheduled.

Cut-off Rule Revoked . . . Prior to Jan. 5, new allotments had to be obtained for orders not shipped in the quarter for which the original allotment was issued. However this cut-off requirement has been revoked. Furthermore, these carry-over orders have priority over those covered by allotments for subsequent quarters.

Reason for NPA allowing mills to accept orders in excess of their raw material supply is to try to validate the allotments now held by utilities and others. In short, more allotments were issued for these products than can be filled from the available raw materials.

There is a chance that some similar action may have to be taken in the second quarter in view of the continuing tight supply of copper raw materials. This would string second quarter deliveries over to the third.

Effect on Utilities . . . Here's how metal controls affect the wire mills and the utilities:

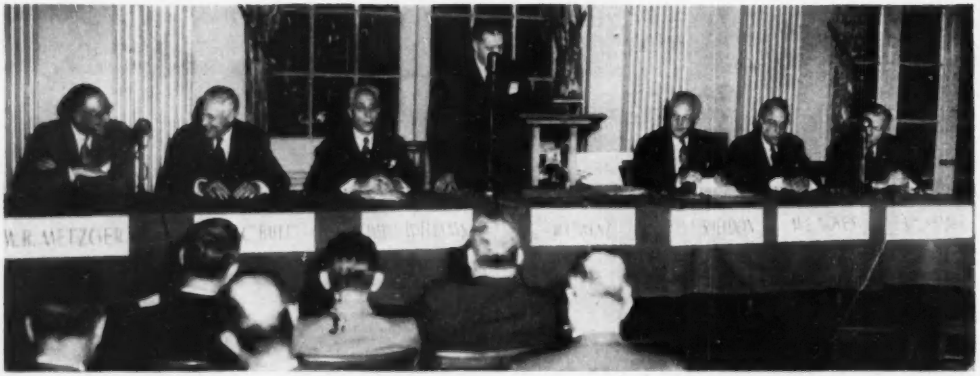
Each month NPA's Copper Division sets aside a portion of the available copper supply to be allocated to wire mills. The wire mill branch of the division, in turn, allocates this copper to the mills on a historical pattern based on the pre-Korea period.

To get a share of wire mill production, electric utilities apply to Defense Electric Power Administration for the wire allotments they will need in a succeeding quarter.

With the allotment granted by DEPA, the utility must find a mill that can cash it from its monthly copper allocation. Copper does not follow the authorized controlled material order of the utility. The order can only be placed with a mill which can accept it without violating its NPA production directive.

These directives are limitations placed on wire mills relating to their monthly acceptance of orders measured in terms of copper content. One purpose of these directives is to distribute the order load equitably among the mills. The monthly copper allocation to the mill does not always match the amount of production allowed by the directive, but that is the general idea.

By allowing mills to accept orders in excess of those permitted by the directive, NPA is deliberately planning delivery slippage. Evidently this is considered the fairest way of meeting the problem, but efforts probably will be made in the future to avoid overallotment of copper products.

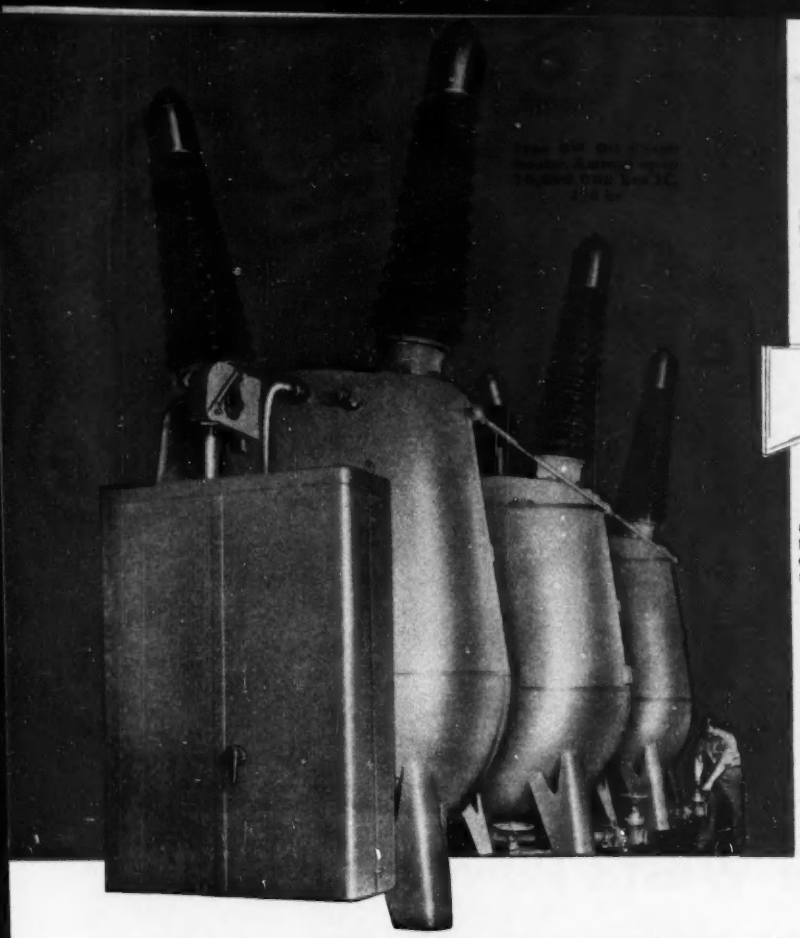


Public Utility Buyers Discuss Metals and Controls

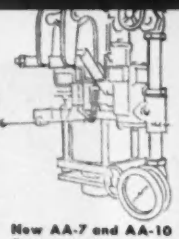
An open forum on the availability and use of metals highlighted the midwinter conference of the public utility buyers group of the National Association of Purchasing Agents held in Cleveland Feb. 3-5.

The metals forum pitted a panel of six (see picture) against an audience of more than 600 purchasing agents and manufacturers, with sharp interchanges on the wisdom and practicability of substituting aluminum for copper. In the panel were A. B. Bull, vice president, Pioneer Service & Engineering Co; W. R. Metzger, assistant general purchasing agent, Duquesne Light Co; M. E. Noyes, manager, electrical conductor division, Aluminum Co of America; Earl Shaner, editor, "Steel;" A. F. Sheldon, president, Kennecott Wire & Cable Co; and David Williams, manager, construction contracts and electrical equipment bureau, Consolidated Edison Co.

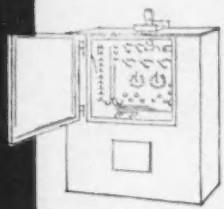
R. C. Wenz, general purchasing agent, Duquesne Light Co, was moderator.



Bushing-Type Current Transformers—up to twelve per breaker



New AA-7 and AA-10 Pneumatic Mechanisms are mechanically trip-free—give 20-cycle reclosing or faster



Condenser Bushing Potential Device—low-cost voltage for instrumentation and relaying

Type MF Multi-Flow De-ion® Grids provide speedy, efficient arc interruption

Type O Condenser Bushings cushion and absorb electrical shocks

New GW "Watchcase" Breaker

SLASHES Oil Requirements!

ANOTHER WESTINGHOUSE HIGH POWER LABORATORY DEVELOPMENT

This Type GW "Watchcase" Breaker, is another example of how Westinghouse High Power Laboratory testing creates new benefits for *you*. Look at these cost-saving features:

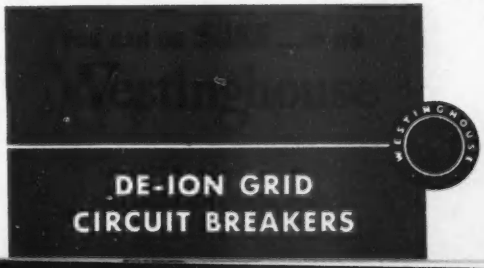
- Reduced oil content—roughly one-half of quantity used in conventional breakers.
- Reduced space requirements—minimum floor space and headroom.
- Reduced foundation costs—smaller size, reduced weight allow for smaller foundation.
- Reduced out-of-service time—less time to handle oil, less oil to filter, less oil handling equipment.

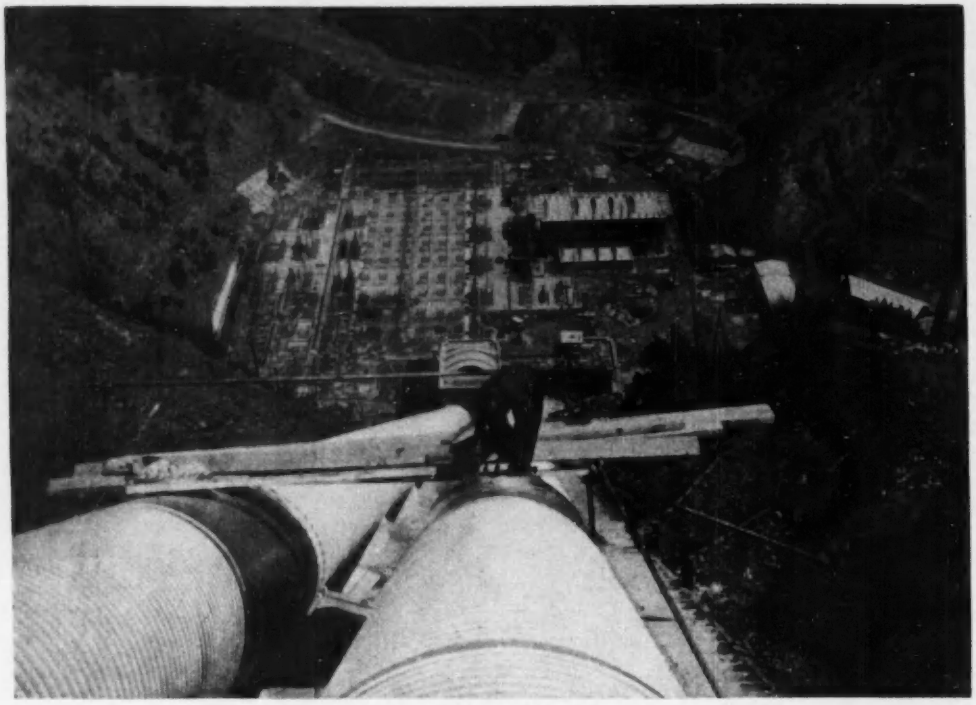
Retains All These Advantages of Conventional Breakers

- Insulation—clearances are as great as in cylindrical tank.
- Safety of dead tank construction.
- Bushings interchangeable with transformer bushings.
- Low-cost bushing current transformers—up to 12 per breaker.
- Low-cost bushing potential devices.

For complete information on the GW Breaker, contact your Westinghouse representative or write for Bulletin DB 33-820. Address: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-60761





U. S. AID in the form of counterpart funds is helping to build this hydroelectric plant on the Oued (River) Agrioun near Karrata, Algeria. The largest power installation in French overseas territories, it will supply 175 million kwhr a year—one quarter of Algeria's needs

Upping the West's Power Supply . . .

. . . is a chief aim of the new MSA. The government has already spent more than $1 billion to raise Europe's capacity

Electric power expansion in Europe will likely get a larger proportion of U. S. aid funds in the next few years than it has in the past.

Reason is that the new Mutual Security Administration, which is taking over the aid program, is charged specifically with helping the immediate defense production build-up as well as the long-range economic strength of the participating countries. This means that many of the less essential activities of the old Economic Cooperation Administration have been dropped with the switch to MSA.

Power expansion qualifies under the dual objectives of MSA, and the new organization is already at work encouraging the participating countries to increase generating capacity. Present plans of the MSA-participating countries call for a power expansion of about 9% each year through 1955. This would bring total capacity in these countries up to 72 million kw—a little less than the present U. S. total.

U. S. aid to power expansion in Europe already totals more than $1 billion in direct dollar aid and equivalent "counterpart funds." These funds are set aside by local governments from sale of goods furnished through U. S. aid. The funds are spent for economic recovery in the individual countries.

Under present law, the equivalent of at least $500 million must be spent each year for European defense production buildup.

Electricity consumption in European industry is increasing rapidly. By 1951 power production was more than double that before the war; half the increase had come since 1947.

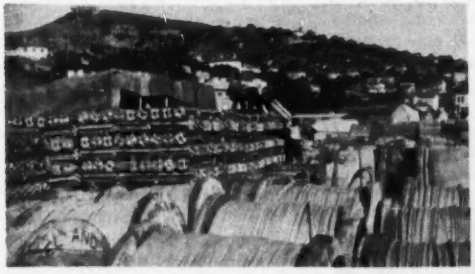
Industrial demands are still a long way ahead of supply and will be even more so by 1954. Latest figures indicate that the gross deficit then will be 4.7 million kw, compared to 3.5 million kw in 1951. Most serious shortages occur in the United Kingdom, Italy, Germany, and the Netherlands, with less serious shortages in Austria and Greece. If hydro conditions are normal, Belgium and France show a substantial surplus of capacity over the estimated peak load for 1951 through 1954.

Priority to Power . . . ECA encouraged governments directly concerned to give electric power projects high priority and to interest private capital and the International Bank for Reconstruction and Development in backing specific projects.

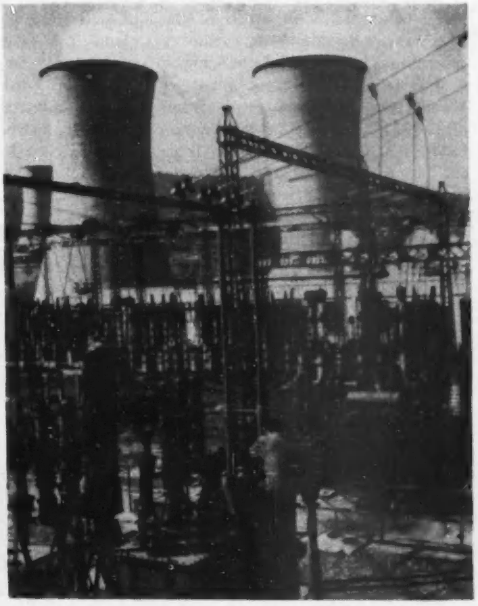
In France alone a total of about $1 billion has been spent on power, of which ECA contributed $38 million in direct dollar aid and $500 million

LIMBERG DAM of Kaprun power project in Austria will be the largest in Europe. Workman is suspended by rope leading off to the right

RELIGIOUS CEREMONY in remote Styrian Feistritz, Austria, celebrated completion of ERP transmission line bringing power to the area

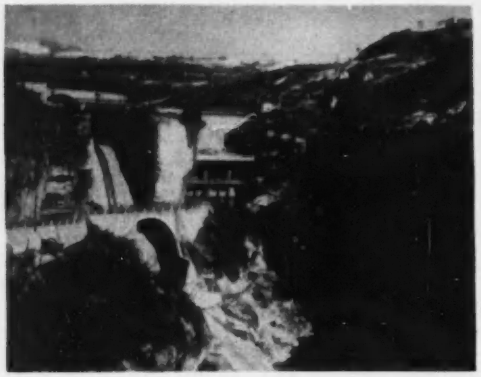


SUBSTATION on new line to Istanbul, Turkey, is Eregli, a small Black Sea port, where ECA material for substations is unloaded



GEOTHERMIC power plant at Larderello, Italy, makes use of natural steam brought up from volcanic wells by American drilling equipment

ALIVERI PLANT on Island of Euboea, 40 miles north of Athens, Greece, will provide 80,000 kw of ERP-financed power when completed



RHONE VALLEY Project in France kicked off with 390,000-kw Genissiat Dam, presently the largest in Europe. U. S. footed part of bill

LOCH SLOY DAM above Loch Lomond is part of North of Scotland's plan to tap 600 Mw from Scottish lakes. U. S. equipment helps

in counterpart funds accumulated under the Marshall Plan.

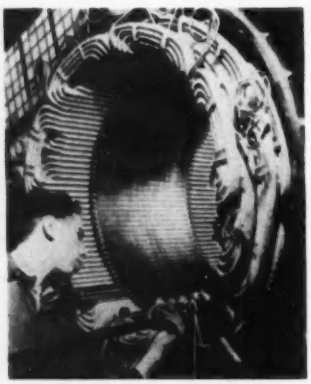
In 1949, an allocation of 3,130 million francs in counterpart funds was made for the vast plan to harness the Rhone River and supply France with an extra 14 billion kwhr a year.

The first step in this 30-year, 22-dam project was the mighty Genissiat Dam. This dam, constructed with the aid of 2,395,000 francs of counterpart money, is the largest in Europe and has a generating capacity of 390,000 kw. The second step in the project entailed blocking the Rhone at Donzere, the diversion of much of the river's swift-flowing waters into a cement-lined canal, and the building of a dam and hydroelectric plant at Mondragon. Aided by an allocation of 2,850,000 francs in counterpart funds, the Donzere-Mondragon project, when completed in 1953, will boost France's electricity production by 2 billion kwhr a year.

In Austria allocations of counterpart funds for the completion of power projects and for equipment of power plants totaled the equivalent of $55 million as of June 30, 1951. The Kaprun Dam at Hohe Taurerm with its 129-mile power line reaching towards power-short Vienna will ultimately produce 600 million kwhr of energy a year—10% of Austria's total power production. More than two-thirds of the cost of the project—which was completed in the record time of nine months—was borne by ERP (EW, May 14, 1949, p 16).

International Project . . . At Braunau, on the Austrian-German border, construction of a run-of-river generating station on the River Inn has been started by the Austrian-Bavarian Power Co. Total generating capacity will be 96,000 kw in four units of 24,000 kw each. Two units will furnish power to the Bavarian network and two to the Austrian network. Total cost is estimated at 120 million DM or $28.6 million. Dollar financing in the amount of $570,000 was approved by ECA to purchase construction equipment in the United States.

In Italy the Societa Idroelectrica Piemonte of Turin received a loan of $6,215,000 in 1950 for the purchase of a complete 60,000-kw steam power plant. This plant will provide steam support for the hydroelectric power system of northern Italy, and will prevent industrial power caused by seasonal hydroelectric deficiencies. Turin, one of Italy's most important industrial centers, has suffered greatly from power shortages since the war.



COPPER from U. S. went into this motor being assembled by worker in the Netherlands

Altogether Italy spent $136 million on power projects up to June 30, 1951, of which ECA contributed $66 million.

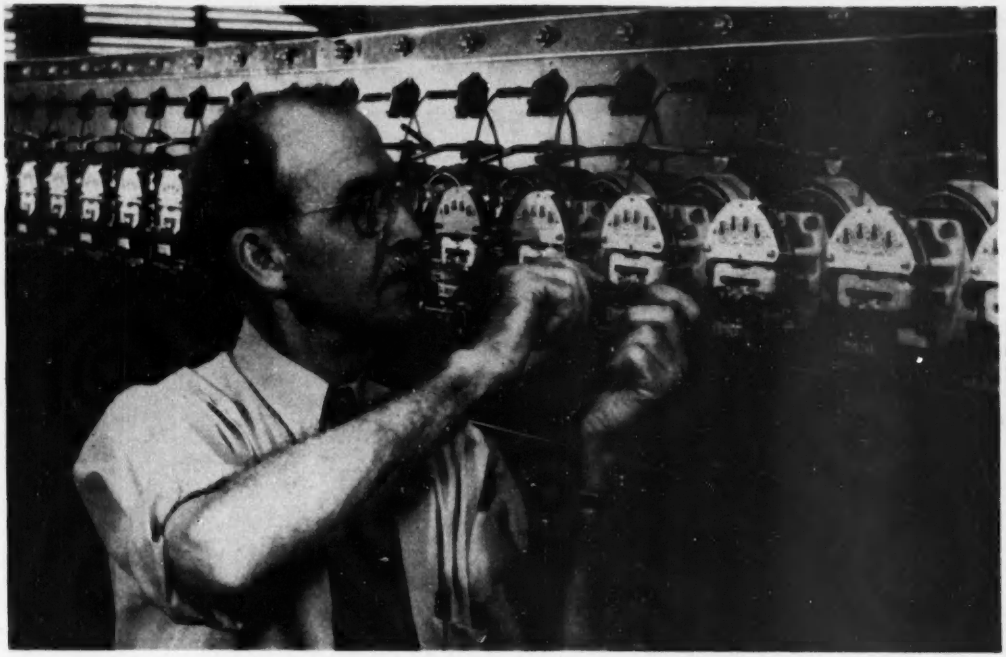
In Denmark a $10-million addition to the Kyndby Power Plant in Zeeland is scheduled for completion this year. The Kyndby plant works in parallel with two other plants in Zeeland and hydroelectric lines from Sweden to supply about 90% of the power used in the eastern part of Denmark. Half the cost of this project is borne by U. S.

In Germany expansion of the East Hanover Steam Power Station aided the rapid comeback of the key port of industrial Hamburg. A Marshall Plan allocation of 10 million DM made possible the expansion of the East Station from a capacity of 70,000 kw to 140,000 kw.

An additional 11-million DM allocation covered major construction costs of a new double circuit line from East Hanover to Hamburg, over which the station's output was transferred to the German power grid.

European Grid . . . There is some interchange of power between neighboring European countries. Interconnections by means of a partial European "grid system," however, are not sufficient to reduce deficits substantially. Surpluses are greatly exceeded by deficits and are not necessarily simultaneous.

In order to reduce these power deficiencies the U. S. encouraged construction of new power plants in those countries having the largest deficits and in those able to contribute most through interconnections.



Sangamo J Meters

preferred by men who work with meters

Your meter superintendent and his men prefer meters that can be quickly and easily calibrated, saving costly man-hours for his company.

Men who work with meters *know*, that Sangamo J Meters, as received, seldom need any calibration to meet all generally accepted standards of accuracy.

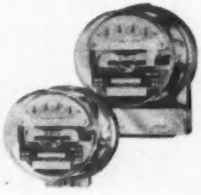
Simple full-load and light-load adjustments—readily accessible from the front, exceptionally clear visibility, and easy removal of registers, are a few of the reasons why J Meters are favorites with meter testers everywhere! They're faster to test—easier to calibrate. An ordinary screwdriver is the only tool needed.

Economical replacement of parts is another of the reasons why the men who work with meters prefer J Meters. When advantageous, either the current or potential element may be replaced separately.

Only Measured Facts are Known Facts

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

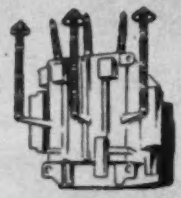
Sangamo J Meters have proved their ability to meet today's requirements and tomorrow's anticipated loads with sustained accuracy, economy of maintenance and troublefree performance.

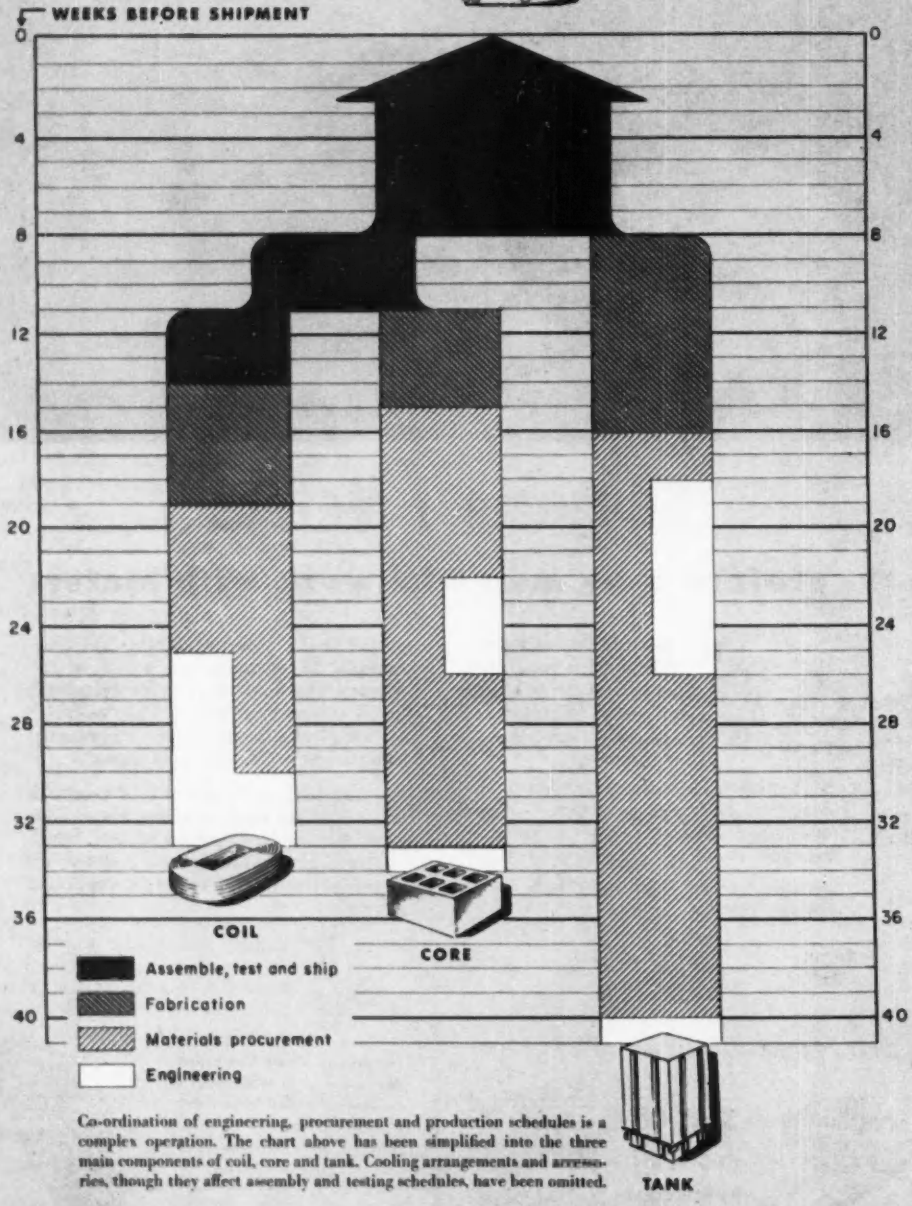


TIME SCHEDULE

For a 145,000-kva Power Transformer

. . . Capacity to operate 124,000 one hp motors at full load, or supply a city of 250,000 people!





Co-ordination of engineering, procurement and production schedules is a complex operation. The chart above has been simplified into the three main components of coil, core and tank. Cooling arrangements and accessories, though they affect assembly and testing schedules, have been omitted.

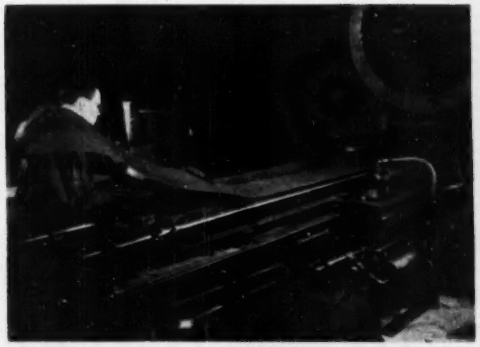
COILS ARE MADE by winding miles of specially insulated copper wire on a winding table. Once wound, each coil is treated with a thermoset plastic and baked in a gigantic oven to provide mechanical stability. The coil construction schedule is approximately 7 weeks

Making Transformers Is a Slow Job

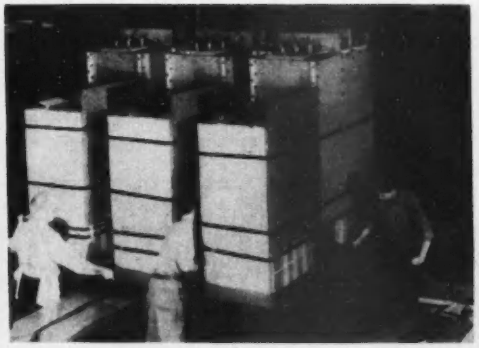
Westinghouse Electric Corp shows that the many manufacturing steps for a 145,000-kva transformer add up to 41 weeks

This year the industry plans to add 46,000,000 kva of power transformers. Threatening this goal are the twin lacks of materials and time. The defense mobilization agencies can do much to assure sufficient materials, but time is something else. It takes so many working days to make a transformer. Manufacturers would be glad to speed up the operation if they could. But each transformer requires a certain number of components; and until a new type of transformer is invented or quicker processing methods are discovered, the industry must reconcile itself to a lengthy manufacturing period.

Westinghouse Electric Corp estimates that it takes 41 weeks to make a 145,000-kva power transformer. Smaller transformers would require less time but not too much less. But



STEEL FOR CORES is sheared after being slit from large rolls. Other operations including annealing bring total time to 4 weeks



ASSEMBLING CORE AND COILS is a meticulous slide-and-fit process. But precise matching produces 99.8% efficiency. Allow 3 weeks

a modern version of an old standby — DELTA-STAR'S

New "PMK"

115 KV 1200 Ampere "PMK" Air Switch

"PMK" 600 Ampere Contact Assembly

Here is an old friend you have long been familiar with for substation and pole-top application. It now incorporates all the modern, trouble-free features which have proved so successful on other DELTA-STAR Switches.

Large, hard drawn copper contact shoes, with oval shaped silver inlays, operate against the hard drawn copper tubular blade to form a high pressure small area contact—assuring superior electrical and thermal characteristics.

Years of wear on the contacts and blade will cause no appreciable reduction in contact pressure because of the long multiple leaf pressure applying springs of fatigue resistant beryllium copper. These springs do not function as current carrying members.

Offset arrangement of contacts combined with the blade motion develops a twisting shear, easily breaking formations of ice and corrosion.

These features **plus** all the well-known standard features demanded by engineers, a minimum number of insulators per single pole element, one contact, tubular blades, free swinging bronze ball bearing terminals, minimum side and overhead clearance, and simple mechanism.

Available in "PMK-22" the two bearing type and "PMK-23" the three bearing type, for upright or inverted mounting in all standard voltage ratings from 7.5 to 161 kv at 400, 600 and 1200 amperes.

CONSULT THE FACTORY OR OUR NEAREST DISTRICT OFFICE FOR COMPLETE INFORMATION

DELTA-STAR ELECTRIC COMPANY

DIVISION OF H. K. PORTER COMPANY, INC.

2437 Fulton Street • Chicago 12, Illinois

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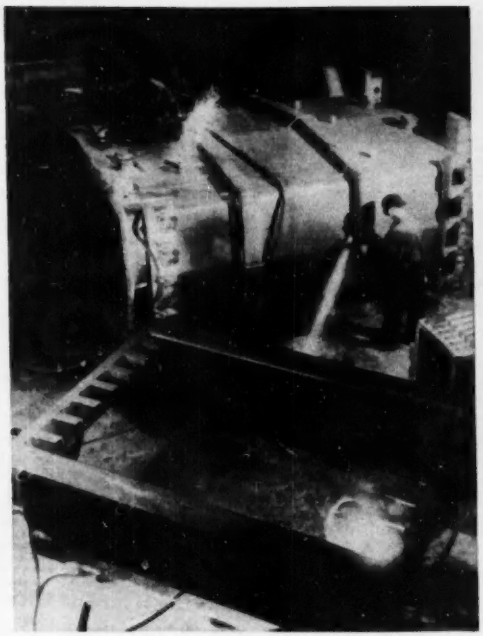


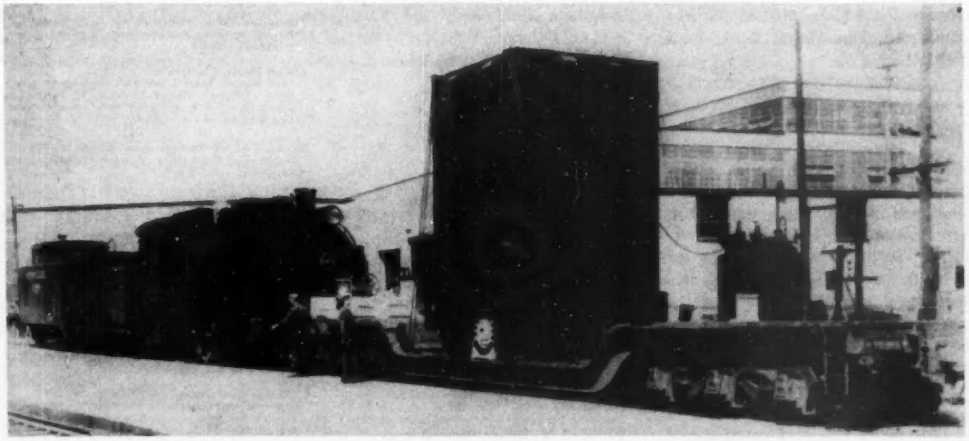
FABRICATION requires care as tanks must be able to withstand the stresses imposed over a wide temperature range of operations

FOR TESTING transformer is moved to special pit. Tests will take 2 weeks. Assembling transformer required the 4 weeks previous

this time is measured from the date manufacture is started. Today manufacturers have backlogs of orders which must take their turn going into the shop schedules. So utilities have to order many weeks ahead of the actual manufacturing schedule—at present as much as 2½ years ahead of delivery on the larger size units.

The materials situation in these days of defense mobilization is equally critical. For every 1,000 kva of rating a transformer requires 1,133 lb of copper, 2,768 lb of silicon steel, and 3,660 lb of carbon steel. All of these metals are CMP controlled.

There are many other materials which go into a transformer. Kraft, rag, and manila papers are used, and some of these require as much as two years to process. Mica, an essential insulator in many classes of transformers, must be imported. Nickel and tungsten are in short supply. Finally the oil and plastics required are made of or use chemicals which are difficult to secure.



PACKING AND LOADING completed transformer takes 2 weeks. Note that the cooling system and the bushings have been removed to protect them from damage during transit. Shipping is made more difficult by need for a special car only a few of which are available

MEETINGS

SEE Conference Is Set . . .

. . . for March 13-14. The Engineering and Operation Section will sponsor the parley to be held at New Orleans

Long range planning to cope with hurricane situations will be one of the topics to be discussed at the Southeastern Electric Exchange's Engineering and Operation Section conference scheduled for March 13-14 at Jung Hotel, New Orleans, La. Problems in serving residential air conditioning and house heating loads will be discussed, too.

Metals to Be Discussed . . . The metals situation will be given attention with discussions centered on the use of aluminum for primary and secondary circuits and services, including fittings, and experience with use of aluminum for high capacity substation buses.

Other topics to be presented include the following:

1. Engineer's place in good public relations.
2. Problems confronting electric operating companies.
3. Operation safety.
4. Methods and relative costs of improving distribution voltage.
5. Use of hollow conductors in high capacity turbine generators.

After presentation of these topics, discussion periods will follow.

Presiding chairmen at the two-day conference will be W. T. Hess, vice president, Louisiana Power & Light Co; J. M. Oliver, vice president and general manager, Georgia Power Co; J. B. Coltharp, superintendent of the Transmission and Distribution Department, Gulf States Utilities Co; P. C. O'Shee, assistant superintendent of Distribution, Alabama Power Co; A. J. Skaale, superintendent of power, Carolina Power & Light Co; H. W. Sterling, manager of production, Eastern Shore Public Service Co; J. A. Rawls, supervisor of electrical equipment and transmission, Virginia Electric & Power Co; and H. L. Deloney, assistant chief engineer, Louisiana Power & Light Co.

PEA to Hold Symposium on Instrument Design

The joint meeting of the Electrical Equipment and Prime Movers Committees of the Pennsylvania Electric Association will be held at the Benjamin Franklin Hotel, Philadelphia, Feb. 28-29.

A highlight of the meeting will be a symposium on "Design of Mechanical Indicating Instruments" sponsored by the Joint Subcommittee on Instrument Design of the Electrical Equipment Committee. W. B. Morton is chairman of the subcommittee on instrument design.

Purpose of the symposium is to enable the utilities and the mechanical instrument manufacturers, who will also participate in the session, to present their viewpoints on the improvement in the design of mechanical instruments used in power plant control rooms.

Discussions will be centered around the reduction in size and shape of instruments, redesign of instruments to provide more light on the dial and eliminate the need for internal illumination, and application of color coding of switchboard instruments.

E. L. Schlottere, Philadelphia Electric Co, is chairman of the Electrical Equipment Committee and Eugene Gordon, Potomac Edison Co, is the chairman of the Prime Movers Committee.

CALENDAR

American Institute of Electrical Engineers
Induction-Dielectric Heating Conference, Carter Hotel, Cleveland, Ohio, February 19-20; Southwest District Meeting, Jefferson Hotel, St. Louis, Mo., April 15-17; Welding Conference, Rackham Memorial Bldg., Detroit, Mich., April 16-18; arranged jointly by American Welding Society, Detroit Section, and Industrial Electrical Engineers Society, Detroit; Northeast District Meeting, Arlington Hotel, Binghamton, N. Y., April 30-May 2; Summer General Meeting, Hotel Nicollet, Minneapolis, Minn., June 23-27.

Pennsylvania Electric Association
Winter Meeting, Relay Committee, Fort Stanwix Hotel, Johnstown, Pa., February 20-21; Prime Movers-Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, February 28-29; Electrical Equipment Committee, Hotel Roosevelt, Pittsburgh, Pa., May 15-16.

Public Information Program
East North Central Region Meeting, Fort Wayne Hotel, Columbus, Ohio, February 21.

North Central Electrical Industries
Annual Convention-Trade Show, Hotel St. Paul, St. Paul, Minn., February 24-28.

American Society for Testing Materials
Spring Meeting-Committee Week, Hotel Statler, Cleveland, Ohio, March 3-7; Annual Meeting, Hotels Statler-New Yorker, New York, June 23-27.

National Electrical Manufacturers Association
Winter Meeting, Edgewater Beach Hotel, Chicago, March 10-13; 4th International Lighting Exposition - Conference, Industrial - Commercial Lighting Equipment Section, Cleveland Auditorium, Cleveland, May 6-9.

National Rural Electric Cooperative Association
Annual Meeting, Conrad Hilton Hotel (formerly Stevens Hotel), Chicago, March 10-13.

National Association of Corrosion Engineers
Annual Conference, Buccaneer Hotel, Galveston, Tex., March 10-14.

Southeastern Electric Exchange
Engineering-Operation Section Conference, Jung Hotel, New Orleans, La., March 13-14; Annual Conference, Boca Raton Hotel, Boca Raton, Fla., April 21-23.

Illuminating Engineering Society
South Pacific Coast Regional Conference, Hotel Sir Francis Drake, San Francisco, March 13-14; Southwestern Regional Conference, Hotel Tulsa, Tulsa, Okla., April 6-8; Southern Regional Conference, Hermitage Hotel, Nashville, Tenn., April 20-22; Canadian National Conference, Hotel General Brock, Niagara Falls, Ontario, Can., April 30-May 2; Great Lakes Regional Conference, Hotel Statler, Cleveland, Ohio, May 5-6; East Central Regional Conference, Webster Hall Hotel, Pittsburgh, Pa., May 22-23; Northeastern Regional Conference, Hotel Preston, Swampscott, Mass., June 19-20.

Pacific Coast Electrical Association
Operating Economics Section Conference, Hotel California, Fresno, Calif., March 20-21; Administrative Services Section Conference, Los Angeles, April 17-18; Business Development Section Conference, Hotel Huntington, Pasadena, Calif., April 24-25.

A&M College of Texas
Annual Conference for Protective Relay Engineers, Department of Electrical Engineering, College Station, Tex., March 24-26.

American Society of Mechanical Engineers
Spring Meeting, University of Washington, Seattle, March 24-26; Semi-annual Meeting, Sheraton-Gibson Hotel, Cincinnati, Ohio, June 15-19.

American Power Conference
(Formerly Midwest Power Conference)
Sherman Hotel, Chicago, March 26-28.

Oklahoma Utilities Association
Annual Convention, Biltmore Hotel, Oklahoma City, March 27-28.

Tennessee Valley Public Power Association
Annual Meeting, Peabody Hotel, Memphis, Tenn., March 31-April 1.

Edison Electric Institute
18th Annual Sales Conference, Edgewater Beach Hotel, Chicago, March 31-April 3; Purchasing Stores Committee, Roosevelt Hotel, New Orleans, La., May 11-14.

Missouri Valley Electric Association
Engineering Conference, Hotel President, Kansas City, Mo., April 2-4.

Maryland Utilities Association
Lord Baltimore Hotel, Baltimore, April 4.

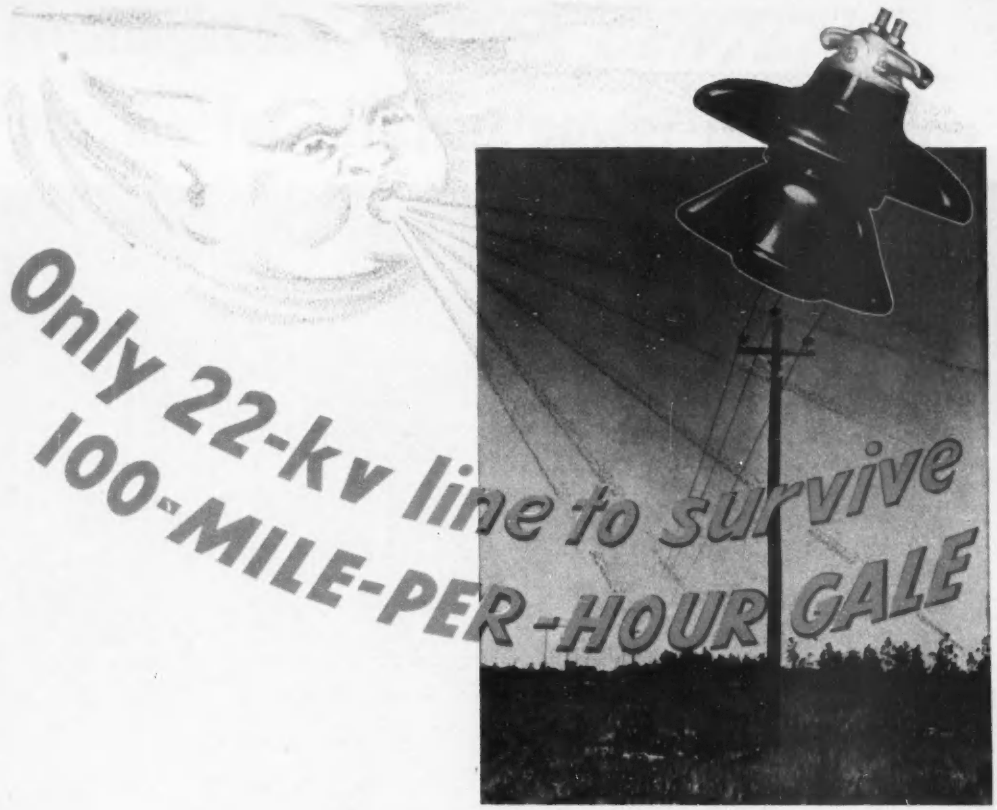
Rocky Mountain Electrical League
Spring Conference, Shirley Savoy Hotel, Denver, Colo., April 20-22.

American Public Power Association
Spring Convention, Hotel Olympic, Seattle, April 29-May 1. Joint Meeting with Northwestern Public Power Association, April 28.

Public Utilities Advertising Association
Annual Convention, Hotel Radisson, Minneapolis, Minn., May 8-9.

C.I.G.R.E. Conference
(International Conference on Large Electric High-Tension Systems). 14th Biennial Session, Paris, France, May 28-June 7.

International Organization of Standardization
Triennial Meeting, Columbia University, New York, June 9-21.



. . . THANKS TO O-B CLAMPTOPS

● First in the Gulf Coast region to be built with O-B Clamptop insulators in 1938, this 22-kv line sustained the famous 1947 Hurricane with its 100-mile-per-hour winds and was the only line in the district that stayed energized and survived the storm completely undamaged.

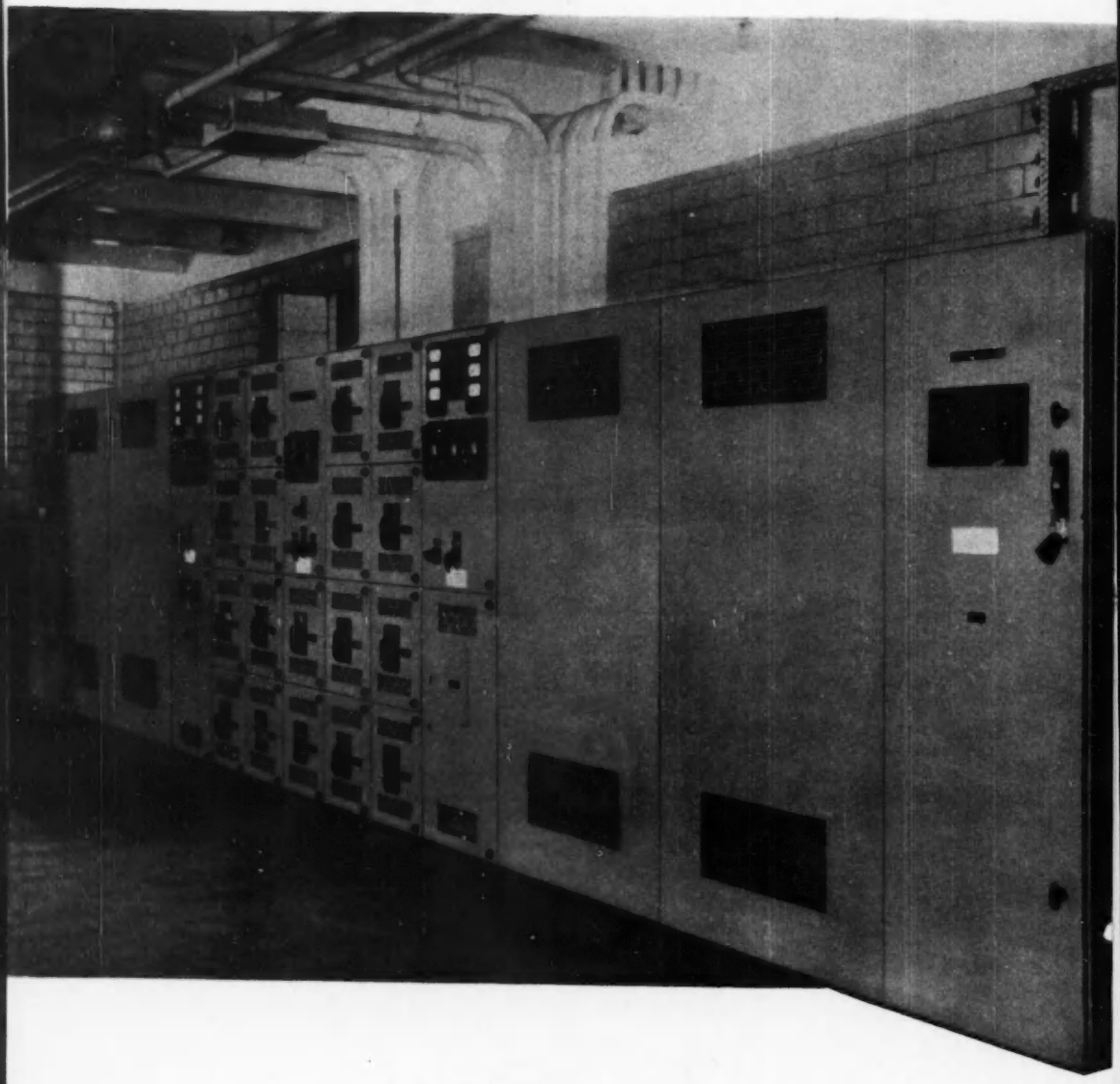
Credit for this performance goes, in no small part, to the secure conductor grip provided by O-B Clamptops. By eliminating tie wire failure or slippage, common in hurricanes, supporting poles have only the strain of the wind to resist since the conductor is anchored against movement that would add unbalanced loading to already severe strains. Each span on this line had no more than its own job to do, since it was mechanically segregated.

You may not have hurricanes in your own territory, although high winds are always a hazard. But, similar loads may be imposed by ice or falling objects. Actually, this Gulf Coast experience, in one form or another, strikes home to every power engineer.

When you add the exceptional holding power of O-B Clamptops to such other advantages as major construction savings, safest hot stick handling, and lowest radio interference, you will have a reason for ordering a supply now. From here on, they'll "write their own ticket" on your system.

Ohio Brass

MANSFIELD · OHIO



Westinghouse *POWER CENTERS* provide for efficient power distribution at Eastman Kodak

Westinghouse Power Centers consisting of dry-type transformers and switchgear are serving the modern power distribution system at Eastman's Kodak Park Works at Rochester, N. Y. Here's how this user rates their performance in this key function.

> *"In recent years, a number of Westinghouse Power Centers have been installed at the Kodak Park Works. These units all have ASL dry-type transformers and are supplied at either 2,400 or 13,800 volts. Capacities range from 300 kva to 1,500 kva. Maintenance has been nominal and no serious trouble of any kind has been experienced. We are well satisfied with the equipment."*

Many specific advantages of Westinghouse Power Centers contribute to such approval of these installations. For example . . .

They cost less to maintain . . . no liquids to test, recondition or replace . . . no gaskets, valves or gauges. All parts are readily accessible.

They're more economical . . . because they eliminate the need for costly vaults and can be located near the center of load . . . resulting in shorter secondary circuits, lower line losses, better regulation.

They're safer . . . from the hazards of fire and explosion; they have no exposed live parts. Breakers and switches have positive interlocking mechanisms, each in its separate compartment.

GET THE COMPLETE STORY

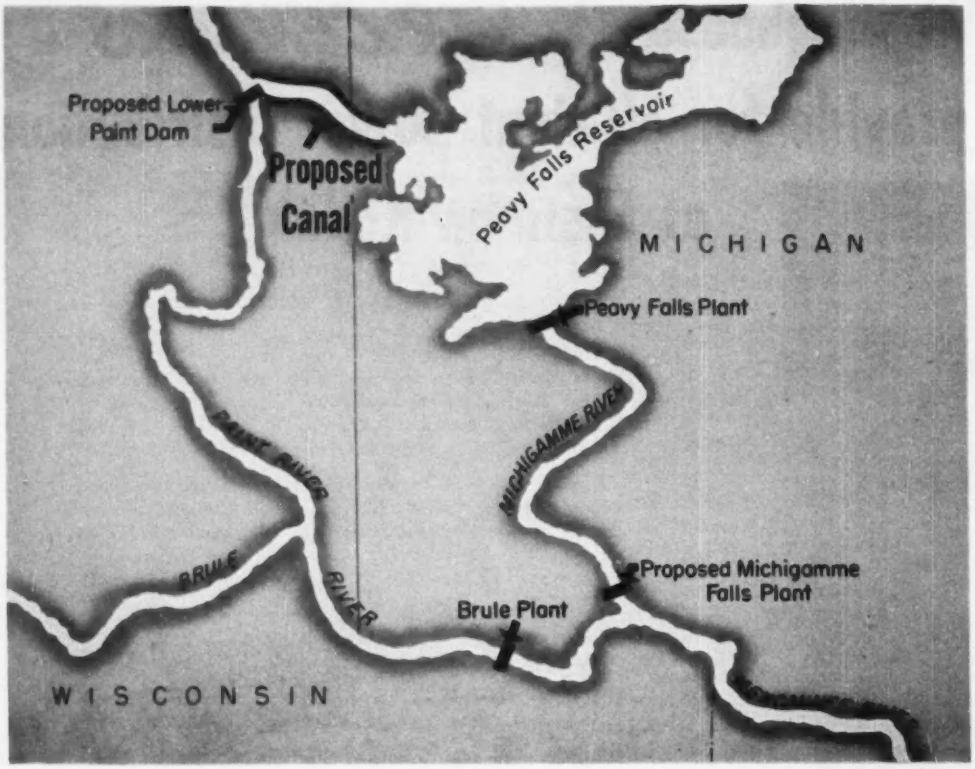
Westinghouse Power Centers provide better service continuity, greater flexibility, better regulation . . . all the things that contribute to efficient power distribution. Most important, they provide the simplest, lowest-cost way of attaining the power system that best meets your operating requirements.

Booklet B-4162 covers Westinghouse Power Centers in detail. Booklet B-4045 discusses various types of plant distribution systems wherein power centers offer maximum advantage. Contact your Westinghouse Representative or write: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-60765

YOU CAN BE SURE...IF IT'S Westinghouse

POWER CENTERS



MAP shows the river area being developed by the Wisconsin-Michigan Power Co, Appleton, Wis. Canal, at top left, will allow waters of the Paint and Michigamme Rivers to work together. Because of topography the water flow will reverse itself at different seasons of the year

Diversion Canal Solves River Development Problem for Utility

Wisconsin-Michigan Power Co links Michigamme to Paint-Brule Rivers. More efficient use of water at two old plants and construction of two others will add 26.7 million kwhr a year

A 1.5-mile canal which allows the waters of three rivers to work together has solved a river development problem of the Wisconsin-Michigan Power Co. By more efficient use of water, made possible by the canal, and the construction of two small hydro plants, the company will be able to increase its generation by 26.7 million kwhr a year. The cost will be considerably less than that of a more favored project previously considered. The canal and both hydro plants are now under construction.

The three rivers involved are the Paint, Brule, and Michigamme. The Paint flows into the Brule about 7 miles north and west of Florence, Wis., and 22 miles north and west of Iron Mountain, Mich. A few miles downstream from this junction the Brule joins the Michigamme to form the Menominee (study the map above).

The company had plants on the Brule and the Michigamme. The next logical step to expand its facilities was to erect a plant on the Paint. The selected spot was at the Horse Race Rapids, a few miles upstream from the river's mouth. Here an 86-ft head could be developed so as to provide water for a 6,000-kw unit.

But the Conservation Commission

of Michigan did not look with favor at such a plant. This is not only one of the state's scenic spots but also a choice spot for trout fishing. Furthermore, from the company's viewpoint Horse Race Rapids would be an expensive site to develop. So the commission and the company got together to find a suitable alternative.

Studies by the utility's engineers and the consulting engineering firm of Mead & Hunt, Inc, Madison, Wis., resulted in a plan that would satisfy both the commission and the company.

The plan takes advantage of the geography of the area and the company's earlier installations on the rivers. The utility's Peavy Plant is on the Michigamme several miles upstream from its junction with the Brule. The Peavy Falls Reservoir, which stores water for this plant, extends over a large area. At one point it is only 1.5 miles from the Brule.

Engineers agreed that it would be quite easy to connect the two bodies of water at this point with a canal. Because of the difference in stream flow at various times of the year, there is considerable advantage in having the waters of the rivers work together. The Brule watershed is to the west, that of the Paint to the north and west, and that of the Michigamme to the north. Normally in spring snows in the Paint and Brule basins melt and runoff before those in the Michigamme basin.

Water Is Conserved . . . At this time the Peavy Falls Reservoir is at its lowest point; so it can easily handle the extra water from the Paint. Later when the thaw hits the Michigamme basin, the reservoir gets so high that it is necessary to spill water at the Peavy Plant. But with the canal available the water can be diverted to the Paint, run down to the Brule, and stored behind the dam at the Brule Plant, to the west of the junction of the Brule and Michigamme.

To make the plan complete two hydro plants are to be constructed. The Lower Paint Dam Plant will be only a 100-kw plant to be located on the Paint, at west end of the canal. The other of 9,600-kw capacity is to be erected at the Lower Michigamme Falls, a bit north of the Michigamme-Brule junction.

The company figures that it will gain in this way. Water from the Paint will be diverted through the canal and then passed through the present 15,000-kw Peavy Plant where a 95-ft head is developed. This water will go down stream through the new Lower Michigamme Falls Plant where a 60-ft head will be developed. This will mean a net gain in head of 95 ft since the water from the Paint will be diverted from the Brule Plant which operates with a 60-ft head.

A Gain in Kwhr . . . Power to be generated each year by water diverted from the Paint is estimated at 23.5 million kwhr at Peavy Plant and at 12.3 million kwhr at the Lower Michigamme Falls Plant. Loss of annual generation at Brule Plant as a result of the diversion is estimated at 10 million kwhr. Generation of 900,000 kwhr at the Lower Paint Dam Plant makes a net gain in output from the combined projects of 26.7 million kwhr a year.

Construction of the canal will be relatively inexpensive and will present no engineering problems. Practically all of the canal will be of earth construction. The ground contour along the route will make it possible to cutaway one side and fill in the other. At some sections a comparatively light concrete retainer wall will be built with earth fill in front of it. Slope of the sides of the canal will be 2½ to 1. Normal width at the bottom will be 75 ft, at the top 150 ft. Depth will normally be 6½ ft.

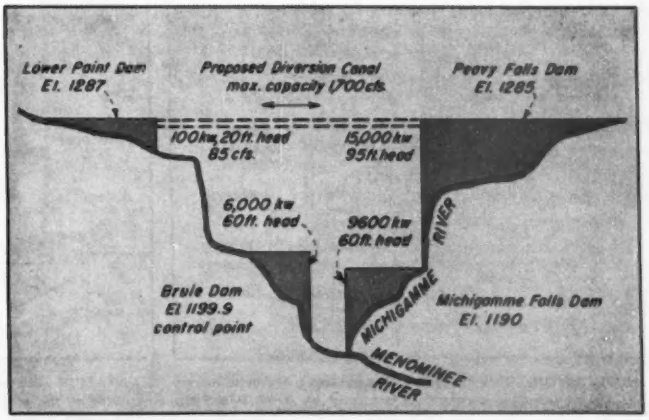
Normal reservoir level above the diversion dam on the Paint River will be from 6 in. to 2 ft above normal level of Peavy Falls Reservoir. This is just enough to give the desired flow of 1,700 cfs through the canal. If the level of the reservoir on the Paint drops below that of the Peavy Falls Reservoir the water will reverse direction and flow into the Paint.

Lower Michigamme Falls Plant . . . will have two units. Water wheels will be vertical-shaft, fixed-blade propeller turbines rated at 6,500 hp each at 277 rpm under a net operating head of 60 ft.

Generators will be of the open type and are designed for 5,333 kva or 4,800 kw each at 90% power factor. Generation will be at 4,160 v, 3-phase, 60 cycle. Hot air from the generators will discharge directly into the room, a feature which reduces installation cost and helps to keep the room warm during the freezing months. This is a cool region; so the extra heat will not be too objectionable in summer months. The semi-outdoor design will further reduce construction costs.

Design of the plant carries out the unit idea with a 5,000-kva, 3-phase transformer unit operating with each generating unit. Provisions will be made for future forced air cooling of the transformers.

Also for economy reasons the entire output of the generators will be handled through a switchgear and switchboard which will operate as one. This has reduced the original and will reduce the installation cost. Barriers will be provided so that a man working on the switchboard cannot get near the energized circuits.



WHY THE CANAL will enable the rivers to work together is clarified by drawing showing elevation of various projects

Cavitation Minimized . . . The water wheel will be 3 ft below the tail race water level. This feature was adopted because studies indicated that the cavitation which develops with a 60-ft head will be reduced to a minimum. It may possibly be eliminated.

One objection to this design is the difficulty of doing maintenance work on the wheel. Stop logs must be put in to block off the tail race waters while making repairs. The water around the wheel also must be pumped out. It is believed that these inconveniences will be more than offset by the reduction in maintenance.

Under certain conditions the plant's units will operate as synchronous condensers. Compressed air tanks will provide the necessary pressure to force the water from the wheels and into the tail race. The units can then be operated as synchronous condensers wthout the heavy losses that would be entailed with water around the wheels.

Lower Paint Dam Plant . . . This plant has been tailored to squeeze the last kilowatt hour out of the 85 sec ft of water which will be passed down the river every second of the year for maintenance of fish life and scenic beauty. Normal operating head will be 20 ft.

A specially built hydraulic turbine of the fixed blade type will be used. Rating is 155 hp at 514 rpm when operating under a net head of 20 ft. There will be no wicket gates on the water wheel thereby holding costs to a minimum. This is the first installation the company has built without wicket gates and is believed to be one of the first ever built. A thrust bearing, tailor made for this job, will be welded on the end bell toward the water wheel. This is to take care of the water thrust. There is no governor on the turbine.

The turbine will drive a standard, 3-phase, 60-cycle, 440-v induction motor. This will operate as a 100-kw induction generator. It has a squirrel cage rotor with no slip ring brushes, no rheostats, no voltage regulator, no exciter, no batteries, and no overcurrent relay except one built into the control switch.

Controls for the unit are of the simplest kind. They consist of a standard reduced voltage, reactor-type starter for a motor. A voltmeter, ammeter, and kilowatt hour meter are mounted on the door.

The starting operation is begun by sending water through the turbine. When the generator is turning at higher than normal operating speed, the controller is operated and throws reduced voltage on the generator. This brings down the operating speed. After a pre-determined period the controller is cut out by by-passing it, and full voltage is brought onto the generator, dropping it down to normal speed. The period of delay can be adjusted.

Supervisory Coatrol Cuts Costs . . . Both the Lower Paint Dam Plant and the Lower Michigamme Falls Plant will be controlled from the Brule Plant. This will cut operating costs by thousands of dollars a year.

At the Lower Paint Dam Plant the generator will be connected through the simple control equipment to a standard 3-phase, 440/7,200-v transformer and a 7,200-v line that will tie directly to the generator bus at the Brule Plant, 6½ miles away. This line would have been needed for supplying the control gate motors even if no generator were installed. Natural ventilation will keep the generator room cool.

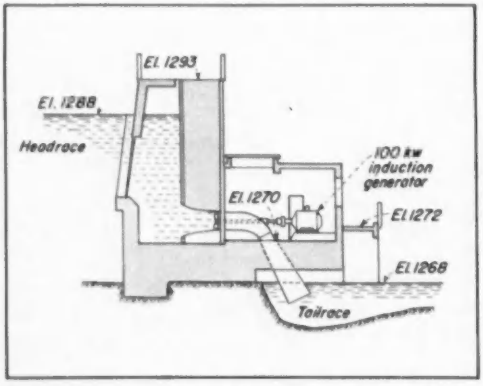
Standard fuse cutouts will open at Lower Paint Dam Plant in case of line trouble. When the circuit is open, the water wheel operates at runaway speed which is about 100% above normal. This is within design limits; so the wheel can operate safely in this manner indefinitely.

The operator at the Brule Plant will know by his instruments when operation is not normal. He can then restore the Lower Paint Plant to normal operation. The plant will be inspected about once every two weeks.

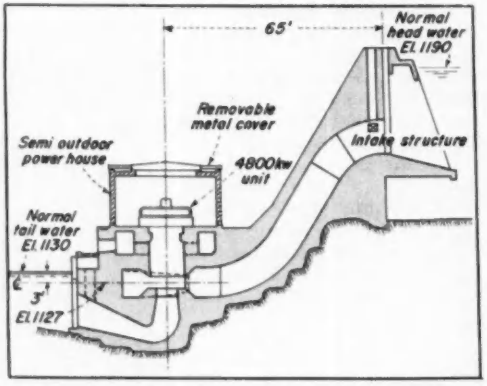
Supervisory control of the Lower Michigamme Plant will be over two telephone wires. The scheme will make it possible for the operator at Brule Plant to:

1. Start and stop either machine.
2. Adjust the output of each machine to the desired amount.
3. Take readings on the output of each machine.
4. Change either machine to synchronous condenser operation.

True to Wisconsin Tradition . . . The project designed to get the last bit of power from every drop of water flowing down the three rivers is in keeping with Wisconsin tradition. The Wisconsin River is often called the "hardest working river in the country." All of these Wisconsin rivers have been developed by private utilities.

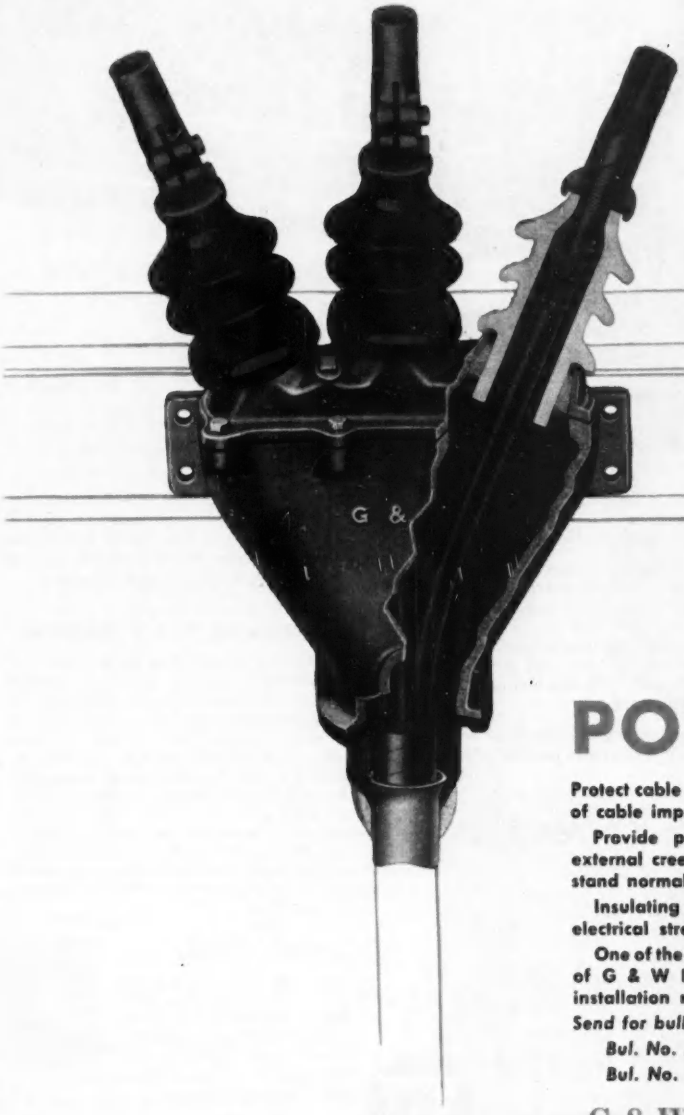


INDUCTION MOTOR which will be operated as a hydraulic turbine and 100-kw induction generator is feature of the Paint Dam Plant



CAVITATION will be minimized at the Lower Michigamme Falls Plant by installing the water wheel 3 ft below the level of the tail race

PROPER SEALING AND TERMINATING OF HIGH VOLTAGE CABLES IS IMPORTANT. IT PAYS TO USE G & W POTHEADS... THE STANDARD OF THE INDUSTRY SINCE 1905.



POTHEADS

Protect cable ends against moisture and leakage of cable impregnating oil.

Provide permanent porcelain internal and external creepage of adequate length to withstand normal and surge voltages.

Insulating compound in potheads improves electrical strength.

One of the hundreds of sizes, types and shapes of G & W POTHEADS will exactly meet your installation requirements.

Send for bulletins for complete data and prices:

Bul. No. AA50—Soldered porcelain type.

Bul. No. AB51—Capnut and other types.

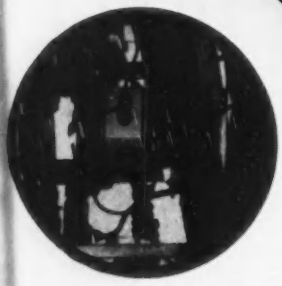
G & W "FORETHOUGHT" A2-8 EXPLAINS THE THEORY OF STRESS RELIEF COILS AS USED IN POTHEADS. SEND FOR YOUR COPY, THERE IS NO OBLIGATION.

G & W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois

Cable Terminating, Connecting and Sectionalizing Devices
Representatives in principal cities of U. S. A.
In Canada—Powerlite Devices Ltd. Toronto and Montreal

All in ONE NEAT PACKAGE Ready to install!

LESS THAN $5.70 PER KVAR IN 300 KVAR SIZE, INCLUDING SWITCHES! AND CONSIDER THE SAVINGS IN INSTALLATION TIME AND MAN-HOURS!



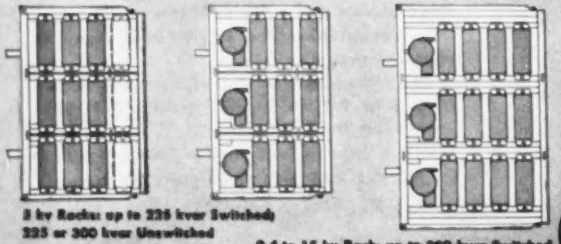
Terminal box for control wiring, readily accessible from the pole. Upper photo shows two 225 kvar switched racks being hooked up.

Hang it up . . . hook it up . . . and the job is done! That's how you make your *first* savings, in time and labor.

Then you *go on saving*, because this is a low-cost switching arrangement. It reduces the number of substation installations. You can put L-M Capacitor Assemblies farther out on the line, where they will do the most good. They are available in 225 and 300 kvar, switched or unswitched.

These packaged assemblies come completely crated and padded. No damage to painted surfaces; no maintenance painting after installation. To install, merely remove four bolts to release assembly from skid. A handy lifting yoke is available without charge.

Manufactured in these 3 assemblies



2.4 kv Racks: up to 225 kvar Switched; 225 or 300 kvar Unswitched

2.4 to 15 kv Rack: up to 300 kvar Switched

All Components Are L-M Manufactured

SWITCHES are L-M's standard heavy-duty Kyle type GR, for remote control, rated 100 amperes at 15 kv. *TERMINAL BOX* has removable cover making it easy to connect control cable before rack is removed from skid, or after mounting. *RACK* is heavy angle steel, with high factor of safety in its rugged design. Every *ELEMEX CAPACITOR* and component individually tested, as is the completed assembly . . . *at the factory*. *CONTROLS* not included, but fully automatic control may be provided with L-M's Voltage Sensitive Control.

GET THESE BULLETINS

Your L-M Field Engineer will gladly supply complete information and bulletins; or write Capacitor Division, Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL Elemex Capacitors

Complete Coordinated Equipment for Distribution Today

73-I

the Performance of ELEMEX Capacitors Proves it!

When L-M engineers started designing capacitors, about ten years ago, they worked closely with utility engineers to learn what customers needed in capacitor design and performance. ELEMEX capacitors were *designed* to meet customers' needs. Now ELEMEX capacitors have been improved to serve those needs even better. Here are some of the features—some of the "extras" that ELEMEX capacitors give you!

1. Longer Life: low insulation unit stress on the pack—the heart of the capacitor.

2. Stronger solder-sealed bushings. It takes about 1900 pounds to force an L-M bushing out of the cover. Bushings are tested 100%—*every* bushing!

3. Pure aluminum electrodes—not just tinned copper.

4. Easy installation—with uniform terminal height above mounting flanges; "Paragroove" connectors simplify hookup.

5. Low-cost maintenance: L-M introduced stainless steel tanks, will continue to produce them as long as possible. Mild steel tanks have *three* coats of enamel *baked on* individually, not just one or two spray coats.

6. Streamlined tanks, with rounded corners for appearance and maximum resistance to corrosion. (Important in painted mild steel units).

7. Convenient packaging, in wood-reinforced cartons with protection at friction points. Cartons stamped sides and top; unit remains in the carton from finishing bench to the pole.

8. Simple, efficient switching for small or large capacitor banks. Another L-M extra.

R. G. ELY

A. S. JOURDAN

Ely, Jourdan Elected VPs . . .

. . . by Connecticut Light & Power. Fleming is named treasurer; Probst is appointed secretary of the company

Robert G. Ely has been elected vice president in charge of sales for Connecticut Light & Power Co, Hartford, Conn. He succeeds A. V. S. Lindsley, who has retired in accordance with the company's retirement program. Albert S. Jourdan has been named vice president in charge of employee relations.

Other Appointments . . . The company also named Paul R. Fleming, secretary and vice president since 1947, treasurer. Fleming replaces John Kramarsik, who has resigned from that office because of ill health. However, Kramarsik will serve as assistant to the new treasurer.

Robert F. Probst, assistant secretary of the utility, has been elected secretary. Both Richard P. Peale, assistant treasurer, and Charles J. Ramage, office manager at Willimantic, Connecticut L&P's eastern division, replace Probst as assistant secretary. Peale will continue as assistant treasurer.

Ely joined Connecticut L&P as director of sales in 1951. Prior to joining the company he had been assistant manager of power sales for Public Service Electric & Gas Co, Newark, N. J. He started with Public Service in 1926.

Jourdan, manager of Connecticut L&P's central division at Meriden since 1939, began his career with the utility at Branford in 1910 and was made manager there in 1912. In 1918 he became manager at Waterbury and at New Britain in 1921. Four years later he was made assistant to the vice president and then manager at Meriden.

Fleming started with the utility in 1930 as assistant secretary. From 1912 to 1927, he was with Stone & Webster and then worked with the Philadelphia & Reading Coal & Iron Corp before joining Connecticut L&P.

Veteran Employee . . . Probst was employed by the Connecticut utility 28 years ago in the accounting department and since 1942 has been assistant secretary.

Joining the company in the operating department in 1922, Kramarsik was transferred from Waterbury to Hartford as special accountant four years later. He was named assistant treasurer in 1937.

Associated with Connecticut L&P since 1919, Lindsley became sales manager in 1921 and vice president in 1939. He has been a leader in rural electrification work for the past 25 years.

Changes in divisional managerships have been made in the utility's system. G. J. Williams, eastern division manager at Willimantic, succeeds Jourdan at Meriden as central division head. A. M. Wade, Greenwich district manager, becomes eastern division manager. R. I. Coleman, manager of the Naugatuck district, succeeds Wade at Greenwich and R. S. Newhall, street lighting engineer of the utility, is now Naugatuck district manager.

Owens-Corning Appoints Briley a Vice President

John Marshall Briley has been elected a vice president of Owens-Corning Fiberglas Corp. Briley, who is leaving the New York law firm of Shearman & Sterling & Wright, will make his headquarters in the Fiberglas general offices in Toledo, Ohio, where he will assume general executive responsibilities.

Edward J. Detgen has been named sales manager of the General Products Division of Fiberglas. In his new capacity, he assumes leadership for sales programs in the division.

The company also has reassigned two vice presidents. Ben S. Wright, vice president since 1949 and general sales manager since 1947, has been reassigned as vice president in charge of purchasing and trade relations.

E. W. Smith, who was appointed vice president and director of merchandising last May, has been reassigned as vice president in charge of sales branches and training programs.

J. M. BRILEY

They will also make their headquarters at Toledo.

Briley has practiced law in New York with Shearman & Sterling & Wright continuously since 1930. The firm has been special counsel for Fiberglas since 1946.

Detgen joined Fiberglas in 1945 as

sales manager of the firm's Building Materials Division. Prior to 1941 he was chief of the Specialties Division of the U. S. Department of Commerce, and during World War II he was director of the Containers Division of the War Production Board.

Wright became associated with Fiberglas in 1940 and five years later became manager of the firm's branch sales office in Cleveland. He returned to the Fiberglas's general offices in Toledo in 1947. Smith joined Fiberglas in 1949 and has been in charge of merchandising and advertising programs, and sales recruiting and training activities in the company's general sales department.

Babcock & Wilcox Co Fills Executive Posts

Luke E. Sawyer and Edward A. Livingstone have been elected vice presidents of Babcock & Wilcox Co. Sawyer and Livingstone were president and vice president respectively of the recently absorbed subsidiary, Babcock & Wilcox Tube Co. This subsidiary is now known as the Tubular Products Division and Sawyer will be in charge of the division.

J. H. King, vice president of Babcock & Wilcox, has been named to

L. E. SAWYER

head the reorganized boiler division of the company. The boiler division will now comprise what was formerly the marine, stationary boiler, and special products departments. All of these operations will be consolidated under King.

In another appointment, M. Nielsen was made an assistant vice president of the firm. Nielsen will report directly to C. H. Gay, vice president in charge of manufacturing, and will

E. A. LIVINGSTONE

assist Gay in operations of all of the company's plants in the boiler division. He will make his headquarters at Barberton, Ohio.

Sawyer became associated with Babcock & Wilcox in 1910 as a student engineer at Bayonne, N. J. He went to the tube company at Beaver Falls, Pa., in 1919 to handle development work. During the next 20 years he became successively assistant superintendent, plant engineer, and general superintendent. He was elected a vice president of the tube company in 1948 and executive vice president a month later upon the death of P. D. White, then president. He became president in 1950.

Livingstone joined the firm in 1932 and two years later he was transferred to the tube company as manager of alloy tube sales. He became general sales manager of that company in 1939 and vice president in charge of sales in 1948.

King started with Babcock & Wilcox in its student engineering program in 1914. He was assigned to the engineering section of the marine department in 1917, becoming assistant manager of the department in 1928 and manager in 1931. He was elected a vice president in 1945.

Nielsen, who began with the company in 1924, was made superintendent of marine erection in 1938 and superintendent of production of the Barberton plant in 1947. In 1950 he was made an executive assistant and placed in charge of the contract division with headquarters in New York.

W. Thomas Peterson, general sales manager of Beryllium Corp, has resigned. Peterson will return to Detroit where he will re-enter the manufacturers' agency business.

NPA and Depa Disclose New Personnel Changes

Several personnel changes in mobilization agencies affecting the electrical industry have been made recently.

National Production Authority has named R. N. McCollom, Westinghouse Electric Corp, as chief of the Electrical Equipment Division's Outside Distribution Branch. McCollom replaces D. A. Griffith who has returned to Allis-Chalmers Manufacturing Co. Marion B. Elliott, General Electric Co, comes into the division to take McCollom's place as chief of the Switchgear Section.

In NPA's Engine and Turbine Division, John C. Spraggon, manager of the New York office of Westinghouse's Central Station Department, is the new chief of the Steam Turbine Branch. Former chief Philip J. Robinson is returning to GE's Apparatus Division in Chicago. C. J. Grossi, Combustion Engineering-Superheater, Inc, is replacing F. X. Gilg as chief of the division's Boiler Section. Gilg is returning to Babcock & Wilcox Co.

At Defense Electric Power Administration, H. L. Livingood, New York State Gas & Electric Corp, has taken over as chief of the Distribution Section of the Major Projects Control Branch. He replaces C. E. Hartay, who is returning to Duquesne Light Co. Hollis K. Sels, Public Service Gas & Electric Co, succeeds Robert Brandt as director of the Power Supply Division. Brandt has returned to New England Power Co, Boston. Robert E. Sperreng, Union Electric Co of Missouri, replaces B. B. Parker as chief of the Minor Requirements Branch. Parker is returning to Duke Power Co, Charlotte, N. C.

Col Ivan Sattem, former chief engineer with the New York State Power Authority, and Cmdr John O'Shea, USN ret, have joined the staff of Remington Rand Laboratory for Advanced Research, South Norwalk, Conn.

OBITUARY

Roger Sherman White, 87, a pioneer in the electrical engineering field who served 29 years with the Potomac Electric Power Co, died Jan. 23 at Washington, D. C. When he retired in 1935, White was a laboratory tester in Pepco's meter department.

HERE'S THE NEW G-E 32-STEP REGULATOR

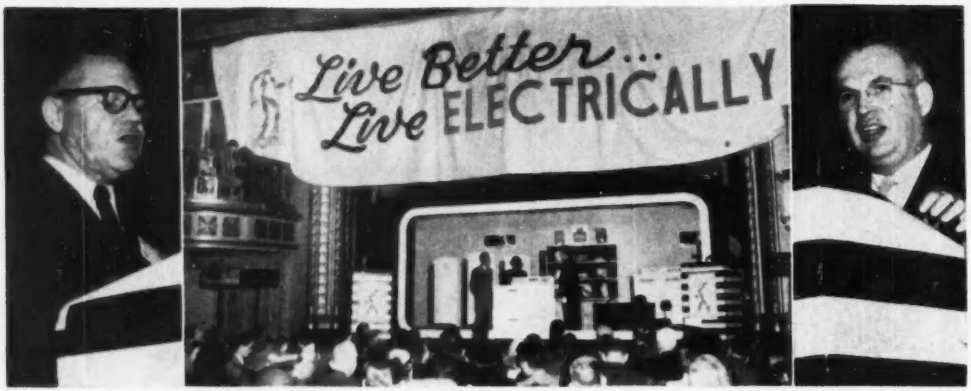
You get single-phase ML32 for same price as 8-step unit. And look at these features!

- **±10% regulation.** 20% range of regulation in thirty-two 5/8% steps.
- **Complete range of ratings** in the 2500-volt class (50 to 150 amps), the 5000-volt class (50 to 100 amps) and the 7620-volt class (25 to 100 amps).
- **New improved switching mechanism** has controlled tap-changing speed that gives maximum contact life.
- **Class I control accuracy**—the highest accuracy classification defined by industry standards.
- **New position indicator** is large magnetic-type, slanted downward for easy reading from ground.

For more information on today's best regulator buy get in touch with your local General Electric Apparatus sales office. Or write General Electric Co., Sect., 404-89, Schenectady 5, N.Y.

GENERAL ELECTRIC

404-89



OVER 1,000 REPRESENTATIVES of the local electrical trade heard Merrill E. Skinner, vice-president (left), and Robert E. Coe, residential sales manager (right), of St. Louis utility tell why the company decided to resume direct selling of certain large appliances.

Union Electric Announces Resumption of Major Appliance Merchandising

Will sell ranges, water heaters, freezers, and driers. Low saturation of these appliances in area a major reason for step

Union Electric Co, St. Louis, will expand its merchandising activities to include ranges, driers, freezers, and water heaters. The announcement was made at an all-industry dinner in St. Louis on Jan. 29. More than 1,100 dealers, distributors, and others interested in the sale of electrical appliances attended the meeting. Since the war, the company had sold lamp bulbs, certified lamps, and electric housewares in its stores, but its activity in major appliances was entirely in promotion of dealer sales.

Four chief reasons were given by the company for stepping up its merchandising activity. They were: (1) It's going to be harder to sell; (2) saturation of most major appliances in the company's service area is low; (3) loads of these appliances fit into the company's system load curve; and (4) increased company activity in the merchandising field will stimulate dealers to greater sales effort. Recent plant expansion and gas competition apparently were also factors in the decision.

One company spokesman declared that they did not intend to let the gas industry, whether it was LP or any other variety, take their business. Merrill Skinner, vice-president and director of sales, speaking particularly to dealers and distributors, said, "Our plant expansion has been enormous . . . our salvation, like yours, is greater sales." R. L. Coe, residential sales manager declared that this year of 1952 marks a crossroads . . . the end of the era of easy selling.

Competition-Saturations-Load Curves . . . Mr. Skinner stated, "We will continue to provide the kind of sales leadership you have come to expect of us." Emphasis, he said, will be on:

1. Items in competition with gas.
2. Items that are new . . . or of which public acceptance is low.
3. Items that have more than ordinary value to the utility because of the way they fit into the load curve.

Water heater and TV saturations were compared as an example of the need for special attention to the merchandising of certain appliances. Although water heater saturation on the system is six percent, in the city of St. Louis it is only one percent. Promotion of off-peak water heating was started in January 1947. St. Louis' first TV station went into operation in Feb. 1947 and TV saturation is now 60%, or 60 times as great as that of water heaters in the city.

Mr. Skinner declared that selling water heaters may be harder than selling TV but he didn't think it was 60 times harder. He said, "We expect to help you do this job of selling water heaters . . . ranges . . . and other low saturation appliances with hard hitting campaigns . . . but we also plan to have some of our own men out ringing door bells . . . stirring up business . . . after orders.

"We have invested millions of dollars to extend electric lines so that every farm in our territory now has service available. We know it takes time and effort to get out and see these rural people . . . maybe more than you feel the business will warrant. But this hasn't slowed down the bottled-gas dealers, and we have too much at stake to run the risk of losing markets to them.

"We want to be sure that you understand our objectives. We are in the electric utility business. All of our sales activities are designed to further the sale of electric energy . . . Our resumption of the sale of major appliances will not be at the expense of our help to you . . . Our promotional plans continue the programs you have

known in the past . . . our merchandising activities will be in addition to these programs."

Appliance saturations in the area were cited—home freezers, 3%; water heaters, 6%; clothes driers, 3%; ranges, 18%.

Campaign Planned . . . Plans were announced for four campaigns:

1. Ranges and water heaters vs bottled-gas.
2. Edison Week—launching annual spring sales campaign.
3. "Our Family Kitchen" contest.
4. "Name your Quota" contest.

The campaign directed against bottled-gas competition will be supported by 16 mailings each to the 40,000 customers outside the areas served by regular gas. These will tell the story of lower cost and better performance.

During Edison Week, Feb. 10-16, special sales activities were planned to be conducted with advertising and promotional activities coordinated with dealer and distributor programs. As a special inducement to make users out of salesmen, range or water heater installation cost up to $50 will be paid by Union Electric on any range or water heater purchased by a salesman of these appliances during the month of February.

"Our Family Kitchen" contest will be directed toward high school students and will encourage them in kitchen planning. A total of $5,000 in prizes will be awarded, 165 prizes ranging from $20 to $200 each.

In the "Name Your Quota" contest distributor and dealer salesmen will receive added cash bonuses based on the quota each sets for himself. The higher the quota he sets, the more extra cash he gets—if he makes the quota.

Worried About Price Cutting

Old kettles, cups and saucers, jackknives and various other bric-a-brac are being accepted for trade-in allowances varying from $4 to $50 on appliances ranging from electric tea kettles to larger items. Sight-unseen, allowance of $75 is offered for old washers, $100 for old ranges. One dealer offers allowance of $150 on a brand-name refrigerator for a drinking water tumbler, an old mop or a broom. So reports Electrical World's news correspondent from Vancouver, B. C.

No reports of such extravagant deals have been received from cities in the United States, but that the price-cutting fever may be approaching epidemic proportions is indicated by information from appliance manufacturers and by current newspaper advertising of department stores and other appliance dealers.

A marketing program for meeting price-cutting and distress merchandising practices with creative selling was the subject of a letter to dealers from Edward R. Taylor, vice-president, Hotpoint, Inc. The appliance business, said Taylor, is being jeopardized by the "deal artists who believe the selling job can be done simply by manipulating prices and reducing margins."

Landers, Frary & Clark has decided to "fair trade" its new vacuum cleaner and associated items in states that have such laws, Lee Moss, sales manager for home cleaning equipment, announced recently. This action was taken because, according to Mr. Moss, "a small minority of dealers has so disrupted the vacuum cleaner business that the kind of dealer we want will be greatly discouraged from either staying in the field or entering it."

Mercury Vapor Lighting Enhances Business Area

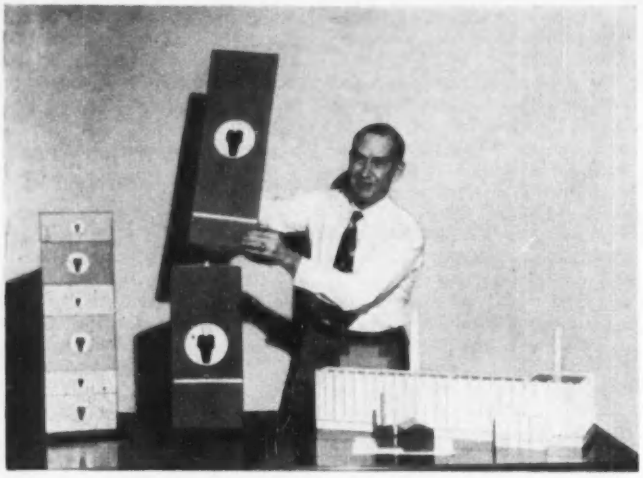
A modern mercury vapor street lighting system has been installed in the Toms River (N. J.) business area by Jersey Central Power & Light Co. The increased illumination, according to merchants and municipal officials, enhances appearance of the shopping area both by day and night, offers better visibility for motorists, aids police duties, and provides a feeling of safety to pedestrians.

Installation consists of 28 GE form 109 luminaires with Type E-H1 20,000-lumen mercury lamps, mounting height 28 ft, spacing 100 ft staggered, street width 45-60 ft. Sixteen of the luminaires are installed on all-aluminum poles with 6-ft brackets, the balance of 12 on wood poles with 6-ft, all-aluminum brackets. Calculated intensity is 2 ft-c.

Credit Line—Westinghouse Electric Corp

Diamonds in that Dust—Maybe!

Literally there could be diamonds in the dust of jewelry store showcases and window displays. But Reine, Inc, jewelry salon on 57th Street, New York, N. Y., is not going to be bothered about that problem nor the irksome task of keeping clean and dust-free black and white velvet backgrounds. A hand vacuum cleaner is used to do both the dust and diamond catching job in its displays. While lost diamonds in such displays are pretty much of a rarity, yet tell-tale dust and dirt on the velvet are every day problems. In a matter of minutes and with a little poking around in the contents of the bag of the vacuum cleaner, a lost diamond can be quickly recovered.



Visualizing a Company's Gains

Graph-o-blocks, which he designed, are being used by Henry B. Sargent, president of Central Arizona Light & Power Co, to show customer, sales, and revenue growth. The colored blocks are used at meetings of stockholders, employees, customers, and the general public. Triangular shape makes it impossible for spectators to see more than one side at a time. But each side can carry a year's story. As new president of Arizona Public Service Co (See Page 7), Sargent will have plenty of use for his invention.

New: ANTA Industry Plays

The American National Theatre and Academy has formed a new division to help private companies and communities plan and execute anniversary celebrations, expositions, conventions, and other forms of applied showmanship.

The division, the Department of Community and Industrial Showmanship, will supply technical personnel and know-how necessary in the production of a community or industrial project lasting a day, a week, or many months.

ANTA's new department will arrange for the writing of any scripts necessary or will work in conjunction with a company's public relations department. Professional actors will be engaged for leading roles and where possible members of local theater groups and company personnel will be used in carrying out a project. An ANTA director will have charge of the whole production.

Alfred Stern will direct the activities of the newly formed department. A group of theatrical specialists will be organized to function with the department which will make its headquarters at the ANTA Playhouse, located at 245 West 52nd St, New York 19, N. Y.

Wrong Address All Right for This Job

An incorrect address is being used by Cleveland Electric Illuminating Co in its national advertising promoting Cleveland as "The best location in the nation." But there is a good reason for this. It permits the company to measure the response to ads in various publications.

Ads in Business Week carry the address 77 Public Square. All other publications carry a different Public Square number. None carries the correct one. The postal authorities don't care because CEI mail is not delivered but is picked up at the post office by company employees.

Wiring Group Proposes New Copper Formula

If copper available for home wiring is reduced 40%, as suggested by recent government announcements, and assuming 800,000 home building starts are made in 1952, copper saving achieved will amount to only about 1/5 of 1% of the total 1952 availability of the metal.

This point was made by the Industry Committee on Interior Wiring Design, a joint organization of interested groups in the electrical industry, in a brief recently submitted to Manly Fleischmann, defense production administrator.

The committee suggested that instead of an overall slash of 40% in the 35 lb of copper now permitted for each home wiring job, a flexible formula be adopted: 25 lb of copper, plus 0.5 lb for each 100 sq ft of living area, based upon outside dimensions, as a minimum wiring requirement; plus allowance for additional facilities required in certain instances. (Note: This formula allows for one heavy-use appliance.)

The "certain instances" cover installations where public services other than electric are not available and major appliances additional to the one allowed in the formula are needed. The group suggested 3½ lb of copper be allowed for each such additional appliance.

The brief considered the possible use of aluminum conductors for home wiring. It pointed out that aluminum wire of EC grade—61% conductivity—may be substituted by the next smaller size of copper wire, but that aluminum of lesser conductivity would probably be impractical for this use. Aluminum for house wiring is prohibited at present, the brief pointed out.

Visitors Welcomed

Visitors to the main office of Atlantic City Electric Co are handed a pamphlet containing information about the company. After expressing the hope that the visit will prove both pleasant and satisfying, the pamphlet lists all officers of the company including department heads, gives a short history of the company, and presents a series of interesting statistics.

Here's where you use

SUPER CORONOL*-GEOPRENE

Power Cable

- ***Aerial or Underground Transmission and Distribution Systems***
- ***Station and Apparatus Circuits***
- ***Mine Power Circuits***

Wherever your schedule calls for high-voltage non-metallic cable, make General Electric Super Coronol-Geoprene power cable your choice for all-round service. Where operating conditions demand exceptional resistance to ozone, heat and moisture, Super Coronol's insulation provides extra-long service life.

And, the specially compounded Geoprene jacket gives additional protection against sunlight, oils, soil acids and alkalies, and flame.

The sturdy Geoprene jacket is far tougher than any natural rubber jacket and will take mechanical abuse during and after installation. Yet, Super Coronol-Geoprene cable is lighter, more flexible than metal-clad types—is easier to handle, easier to install.

Where temperatures run high, choose Super Coronol-Geoprene cable. It permits high current-carrying capacity and small conductor sizes because of its high temperature rating.

Wherever you meet high-voltage cable applications, think first of G-E Super Coronol-Geoprene power cable.

*Registered Trade Mark of General Electric Company

Get further application and specification data from this Super Coronol-Geoprene Power Cable booklet. You'll also get test data plus splicing and terminating information. Just fill in the coupon and mail it today for your free copy.

Section W68-227
Construction Materials Division
General Electric Company, Bridgeport 2, Conn.

Please send a free copy of the Super Coronol-Geoprene Power Cable booklet to:

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

You can put your confidence in—

GENERAL ELECTRIC

V.C. CABLE

Wherever you need resistance to heat, oil and grease . . . specify Roebling Varnished Cambric

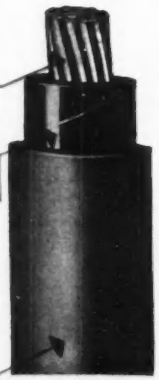
AS LEADS for generators, transformers, motor and oil switches . . . for general distribution of heavy power loads in manufacturing and industrial plants, your top specification is Roebling Varnished Cambric Cable. . . . Roebling V.C. is made in single conductor sizes from 2,000,000 C.M. to #14 A.W.G.; in multiple conductor sizes from 750,000 C.M. to #14 A.W.G. It is recommended for use up to 17,000v between phases in single or multiple conductor construction; and to 26,000v for single conductor grounded neutral.

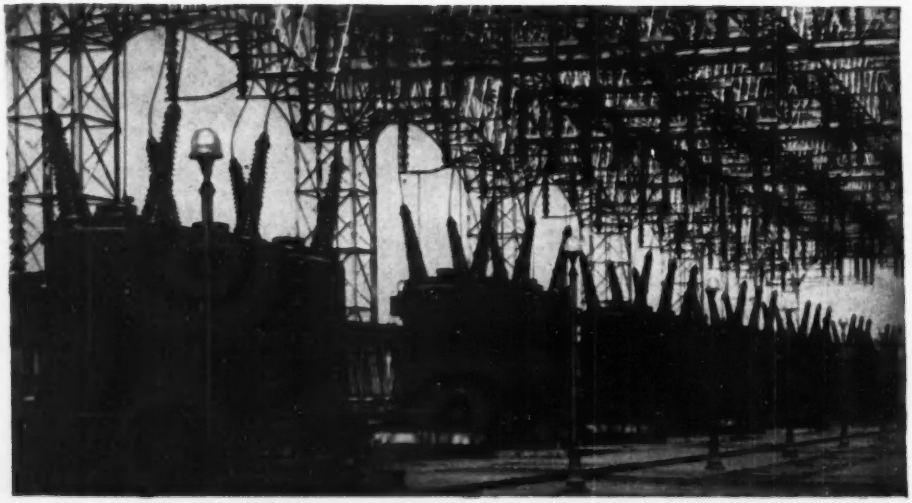
Large quantities of Roebling's complete wire and cable line are now required in the rearmament program. The Roebling organization and distributors will do their best, however, to meet your delivery needs. John A. Roebling's Sons Company, Trenton 2, N. J.

Manufactured with solid conductors or stranded in a variety of strandings, coated or uncoated, according to your needs. Available in single or multiple conductor.

Insulated with varnished cambric tape, in accordance with I.P.C.E.A. and Underwriters' specifications unless otherwise specified by you.

For outside covering you have a choice of braid, for service in dry locations; lead, for service in damp locations; and for aerial use or direct burial we recommend a protective armor such as steel tape or galvanized round wire armor.





ROEBLING

Atlanta, 934 Avon Ave ★ **Boston,** 31 Sleeper St ★ **Chicago,** 5525 W. Roosevelt Rd ★ **Cincinnati,** 3253 Fredonia Ave ★ **Cleveland,** 701 St. Clair Ave, N.E. ★ **Denver,** 4801 Jackson St ★ **Detroit,** 915 Fisher Building ★ **Houston,** 6216 Navigation Blvd ★ **Los Angeles,** 216 S. Alameda St ★ **New York,** 19 Rector St ★ **Odessa, Texas,** 1920 E. 2nd St ★ **Philadelphia,** 230 Vine St ★ **San Francisco,** 1740 17th St ★ **Seattle,** 900 1st Ave, S. ★ **Tulsa,** 321 N. Cheyenne St ★ Export Sales Office, Trenton, N. J.

FINANCIAL

Within Rights, SEC Says . . .

. . . in claiming jurisdiction over proposed WWP sale. Commission asks court to lift ban on proceedings

Battle over jurisdiction in the proposed sale of Washington Water Power Co was slated to be resumed today—this time before the U. S. Circuit of Appeals in San Francisco.

Securities and Exchange Commission is asking the court to lift its stay on further SEC proceedings in the proposed sale of WWP stock to three Washington State Public Utility Districts. The commission also is asking dismissal of the appeal filed by the PUD's seeking review of the SEC order calling a hearing on the sale of the Northwest utility.

Wants to be Heard . . . In another development, the Spokane (Wash.) City Council has authorized Herbert Hamblen, attorney of that city, to petition the San Francisco Appeals Court for permission to allow the council to be heard either as an intervenor or as a friend of the court in the court's consideration of the proposed sale. Hamblen will plead that a public hearing before SEC on the proposed sale of the two-state utility is in the best interests of the people of Spokane.

American Power & Light Co, which holds all the WWP common stock, proposed the sale Dec. 26, 1951, pursuant to an SEC order for liquidation of American's assets under the Public Utility Holding Company Act. Both American and the PUD's argued that SEC had no further jurisdiction over the sale since it was being made to public bodies. However, SEC scheduled a hearing on the proposed sale for Jan. 28, but the PUD's asked the San Francisco court to review the SEC order calling the hearing. Until the request for review is decided, the court has stayed the Securities and Exchange Commission hearing.

SEC Arguments . . . In asking the court to dismiss the appeal, SEC argues that the action now challenged by the PUD's "is clearly within its statutory jurisdiction over American as a registered holding company. . ." Furthermore, says SEC, since the action does not involve a final order, the question as to SEC's jurisdiction in sales to public bodies is "not ripe for judicial review."

The commission also argues that "prior to final action by the commission, it is settled law that petitioners may not invoke judicial authority to interfere with the conduct of the commission's hearing."

It is pointed out that the hearing scheduled for Jan. 28 was also for the purpose of determining whether SEC should approve a plan for distribution of WWP stock to American stockholders. Securities and Exchange Commission thus argues that it certainly has a right to look into the terms of the proposed sale as an alternative to the distribution plan.

High Court to Review FPC Order on Rates

U. S. Supreme Court agreed to review a Federal Power Commission order which authorized the Consolidated Gas & Electric Co of Baltimore to pay lower rates to the Pennsylvania Water & Power Co for hydroelectricity from the Susquehanna River.

If upheld by the Supreme Court, the order could result in a $1.5 million electric rate reduction for the Baltimore area.

The order was upheld by the U. S. Court of Appeals for the District of Columbia in July, but was appealed to the Supreme Court by the Pennsylvania Water & Power, its subsidiary, the Susquehanna Transmission Co. and the Pennsylvania Public Utility Commission.

Consolidated Gas of Baltimore said it already "indicated its willingness under the order of the Maryland Public Service Commission to have its electric customers receive the benefits of these reductions if and when they become available."

The Supreme Court review will postpone any possible rate reduction for several months, the company pointed out.

FINANCIAL BRIEFS

Construction budgets for 1952: Alabama Power Co, $32 million; Consolidated Edison Co of New York, $105 million; Consumers Power Co, $53 million; Delaware Power & Light Co, $6.7 million; Oklahoma Gas & Electric Co, $15.5 million; Public Service Co of Colorado, $22.6 million; and Tampa Electric Co, $6.8 million.

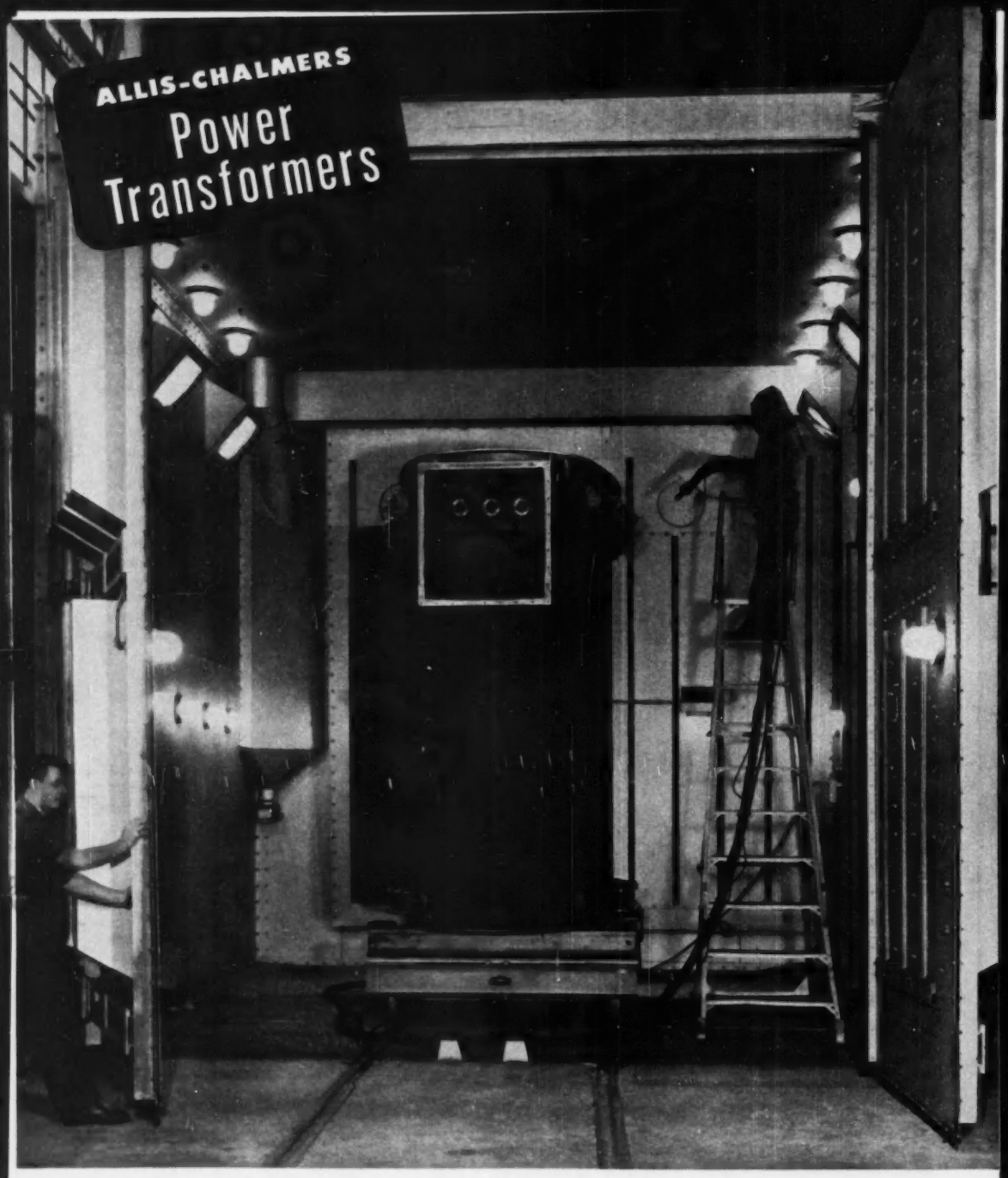
Philadelphia Electric Co stockholders will vote April 9 on proposal to increase authorized indebtedness of the company to $400 million from $265,430,000 . . . Securities and Exchange Commission has denied a request by **Electric Bond & Share Co** to retain its holdings of 27% of United Gas Corp common stock, pending shift of EB&S to an investment company . . . **General Public Utilities Corp** is planning to sell more than 500,000 common shares this summer . . . **Central Power & Light Co** has purchased the Port Aransas electric system for $215,000 and has promised customers a reduction of from 35% to 40% in rates . . . Rauscher, Pierce & Co sold as a secondary offering 6,000 common shares of **Texas Utilities** at 35¼ per share . . . Securities and Exchange Commission hearing on sale of all the Massachusetts gas properties of **New England Electric System** has been postponed from Feb. 5 to Feb. 19, on request of selling companies.

Pacific Power & Light Co will ask competitive bids soon on $12.5 million bonds, Pres. Paul B. McKee revealed. He said company had planned to sell them to insurance companies until it received a better bid from a banking group.

Kansas City Power & Light Co reports that a total of 308,206 common shares of 317,792 offered on 1-for-6 basis at 26½ was taken by holders of subscription warrants. Balance of 9,586 shares was placed by First Boston Corp-Blyth & Co at 27¾. . . **Carolina Mountain Power Corp** has sold privately $250,000 first 4½s 1961 bonds.

Electric common stocks were fractionally higher for the week ended Feb. 9.

(*Continued on page* 43)



CORROSION RESISTANT FINISH. Tanks are shot blasted in this booth to prepare their surfaces for painting. Three coats of paint provide a tough, corrosion-resistant finish. Radiators have a high quality protective coating that is the result of dip-Bonderizing and rotary flow painting.

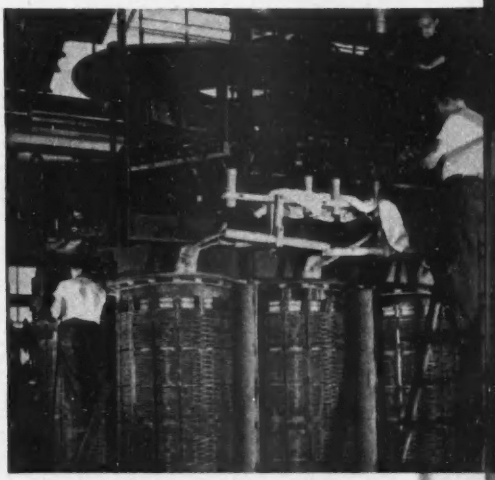
ALLIS-CHALMERS

OREGON UTILITY Boosts Capacity

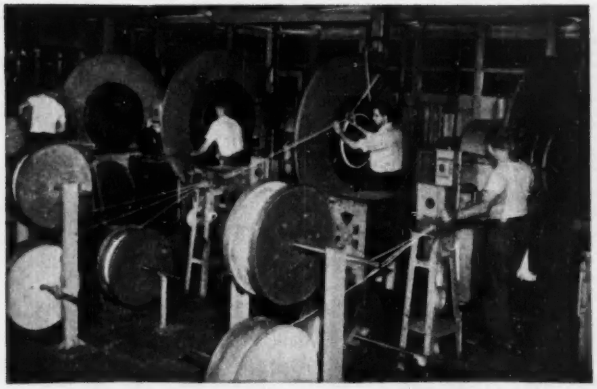
ADDS THREE 6,000 KVA ALLIS-CHALMERS POWER TRANSFORMERS

OREGON RESIDENTS use three times more power than the national average. Records show that 99% of the farms and suburban homes in the area served by the Portland General Electric Company are electrified. And Allis-Chalmers power, distribution and network transformers help PGE — the state's largest electric utility — distribute the power. These 6,000 kva transformers step up capacity for Salem, the capital city of Oregon.

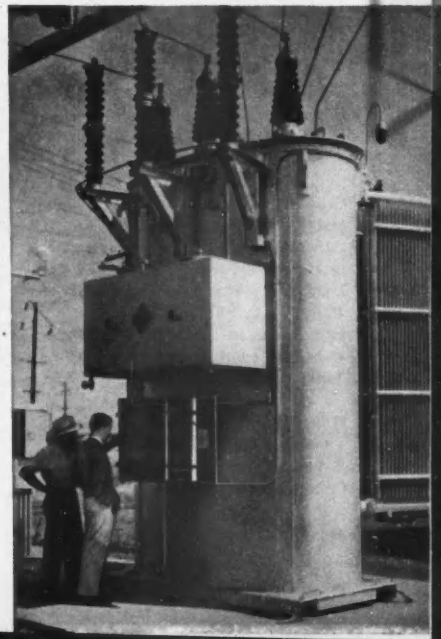
Repeat orders from PGE — and from utilities across the country — are evidence that Allis-Chalmers power transformers are providing dependable, on-the-job service day in and day out. For more details call in your A-C sales representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Offices in 64 principal cities. A-3542



GOOD WORKMANSHIP. Winding and core structure are securely supported and braced. Machine wound tubes, anchored in a sturdy clamping, support and insulate the leads. Good workmanship characterizes assembly work in all stages of transformer assembly.



WINDINGS ARE UNIFORMLY TIGHT. A battery of winding machines winds coils simultaneously from a continuous conductor. This method maintains uniform tightness throughout the winding process and eliminates internal connections. Spacers, uniformly spaced and cemented between coils, give good support and promote coolant circulation.



MORE POWER. This 6,000 kva transformer is one of three Allis-Chalmers power transformers installed at Portland General Electric Company's Middlegrove substation to boost power capacity.

A number of issues went into new high ground for the 1951-1952 period. Among them were: Central Illinois Light Co, Illinois Power Co, Niagara Mohawk Power Corp, North American Co, Pacific Gas & Electric Co, Public Service Electric & Gas Co, and Texas Utilities. A feature on the over-the-counter market was Citizens Utilities Co common which jumped to 19½, an increase of 1¼ points for the week.

YIELDS (%) Operating Electric Utility Securities

Quality	Bonds 1st	Bonds 2nd	Bonds 3rd	Preferred Stocks 1st	Preferred Stocks 2nd	Preferred Stocks 3rd	Common Stocks 1st	Common Stocks 2nd	Common Stocks 3rd
DATE 1952									
Feb. 7	2.91	2.95	3.09	4.17	4.30	4.73	5.33	5.88	6.49
Jan. 31	2.92	2.96	3.13	4.21	4.33	4.76	5.35	5.90	6.50
END OF QTR									
4th 1951	3.02	3.07	3.21	4.32	4.50	4.91	5.42	6.18	6.84
3rd 1951	2.87	2.91	3.04	4.05	4.27	4.61	5.52	6.24	7.05
2nd 1951	3.02	3.11	3.23	4.11	3.37	4.68	5.73	6.38	7.78
1st 1951	2.87	2.93	3.00	3.96	4.19	4.52	5.47	6.20	7.13

Data: Reis & Chandler, Inc.

REGULATION

Florida Power & Light Co has been advised by the new Florida Railroad and Public Utilities Commission to reduce rates about $200,000 a year in Hialeah, North Miami, Miami Springs, South Miami, West Miami, North Miami Beach, and Opa-Locka. The commission stated that facts indicate that present rates could not be justified at a public hearing. Pres MacGregor Smith will discuss the rates with his directors but stated that: "There isn't a whole lot we can do. It looks like we'll have to go ahead and comply with the commission's advisement."

Wisconsin Electric Power Co needs $3.5 million more in rate increases, L. F. Seybold, executive vice president has told Public Service Commission. It would amount to a 6¼% boost over the revenue taken in for the year ended Oct. 31, 1951 . . . **Sen Frank D. O'Connor,** New York City Democrat, has introduced a bill in New York State Senate that Section 4 of the Public Service Law be amended to require that public service commissioners shall be elected at general election in 1952 instead of being appointed by the governor.

Croswell, Mich., Department of Light and Power, effective Jan. 1, has reduced the monthly general commercial rate from 2½¢ per kwhr to 2¢ per kwhr for consumption in excess of 10,000 kwhr. The former rate structure contained the rate of 2½¢ per kwhr for consumption in excess of 7,000 kwhr.

Hon. Clyde F. Boland has been elected a member of the South Carolina PSC to fill the unexpired term of John C. Coney, deceased.

Electric Utility Earnings

(Preliminary)

Company	Period Months	Period Ended	Net Income 1951	Net Income 1950	Earnings per Common Share 1951	Earnings per Common Share 1950
Alabama Power	12	Dec.	$11,100,178	$9,654,079	$...	$...
Central Hudson G&E	12	Dec.	1,793,249	1,682,060	.72e	.71e
Georgia Power	12	Dec.	9,389,414	9,690,285	....	....
Gulf Power	12	Dec.	1,208,965	1,165,299	....	....
Gulf States Utilities	12	Dec.	5,964,575	6,074,914	1.61b	1.85b
Jersey Central P&L	12	Dec.	2,560,553	2,723,802	....	....
Mississippi Power	12	Dec.	1,930,111	1,568,143	....	....
Pacific P&L	12	Dec.	3,596,321	3,261,091	....	....
Portland General Electric	12	Dec.	3,322,860	3,457,875	2.66	2.76
Potomac Electric Power	12	Dec.	5,191,626	4,423,679	1.12	.94
Southern Co and subs	12	Dec.	16,904,728	16,345,474	1.03e	1.06e
Virginia E&P	12	Dec.	10,513,692	10,118,020	1.71a	1.92a

a—on average number of shares outstanding during the period; b—based on 2,884,590 shares in 1951 and 2,719,899 shares in 1950; e—on shares outstanding at end of each period.

Electric Utility Financing

Company and Description	Amount of Offering ($000)	Offering Price	Yield to Public
WEEK OF FEBRUARY 7—13			
Bonds			
Tallahassee, Fla.—electric rev. 1954-1976	$1,400	various	1.50-2.65%
Nashville, Tenn.—electric rev. 1955-1971	2,500	(postponed)	
Preferred Stock			
Pacific Gas & Electric—163,986 sh $25 par 5% 1st Series A (being offered to employees at 24½ of which 23½ is being paid through payroll deductions, to expire Feb. 8; no underwriting)	$4,099	$24.50	5.10%
WEEK OF FEBRUARY 14—20			
Common Stock			
Southwestern Public Service—251,540 sh (being offered to common holders on 1-for-13 basis, record Jan. 30 to expire Feb. 14; stockholders allowed over-subscriptions)	$4,502	$17.50	6.40%
Dayton Power & Light—256,007 sh (being offered to common holders on 1-for-9 basis, record Jan. 28 to expire Feb. 15)	8,192	32.00	6.25
West Penn Electric—440,000 sh (being offered to common holders on 1-for-8 basis, record Jan. 31 to expire Feb. 18)	12,650	28.75	6.96
SCHEDULED FEBRUARY—MARCH—APRIL			
Bonds			**Bid Date**
Central Illinois Electric & Gas—1st mtg 1982	$4,000	.....	Feb. 26
Oklahoma Gas & Electric—1st mtg 1982	12,000	.....	Mar. 4
Central Power & Light—1st mtg	10,000	.....	Mar. 4
Metropolitan Edison—1st mtg 1982	7,800	.....	Mar. 11
Interstate Power—1st mtg 1982	2,000	.....	Mar. 18
Consolidated Edison Co of New York—1st mtg	50,000	.....	Mar. 25
West Penn Power—1st mtg	12,000	.....	Apr. 1
Alabama Power—1st mtg 1982	12,000	.....	Apr. 22
Los Angeles, Calif.—electric revenues	17,000	.....	.....
Narragansett Electric—1st mtg 1982	7,500	.....	.....
Tacoma, Wash.—electric revenues	35,000	.....	.....
Preferred Stock			
Delaware Power & Light—50,000 sh $100 par	...	.....	Feb. 26
Metropolitan Edison—40,000 sh $100 par	,000	.....	Mar. 11
Ohio Edison—150,000 sh $100 par	15,000	.....	Mar. 11
Common Stock			
Central Illinois Electric & Gas—64,000 sh (being offered to common holders on 1-for-10 basis, record Feb. 6 to expire Feb. 21)	1,280	$20.00	6.50%
Maine Public Service—35,000 sh (being offered to common holders on 1-for-5 basis record Feb. 4 to expire Feb. 25; stockholders allowed over-subscriptions)	534	15.25	7.87
Interstate Power—350,000 sh	.....	.....	Mar. 18
Texas Utilities—400,000 sh	.....	.....	.....

More Business for Y-O-U in '52

See how SYLVANIA backs up that profitable prediction with National Ads ... TV Programs ... Popular Premiums

All through this year, Sylvania will be sending business to your contractor customers (and naturally to you too) ... when they display the Sylvania Qualified Lighting Contractor emblem.

Look at those powerful full-page ads. They're just part of the most dramatic and challenging lighting campaign ever run. They'll be seen by millions in *Time*, *Business Week* and other important magazines.

The big television show "Beat the Clock" will also display the Sylvania Qualified Lighting Contractor emblem. Hard-selling full-minute commercials will tell prospects why they should look for that sign on windows and trucks.

Sylvania Light Bulbs, too, will be backed by national advertising featuring another Sylvania premium offer.

And, continuing to build Sylvania's prestige, your customers will see great, smashing full-color ads in *The Saturday Evening Post*, *This Week*, and *American Weekly*. Make no mistake about it, there's big business for you in '52 ... with Sylvania. Mail the coupon for full details NOW!

QUALIFIED
LIGHTING CONTRACTOR
SYLVANIA SALES SERVICE

Urge Electrical Contractors to display this emblem prominently!

SYLVANIA

FLUORESCENT TUBES, SIGN TUBING, FIXTURES, WIRING DEVICES; LIGHT BULBS; RADIO TUBES; TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC TEST EQUIPMENT; PHOTOLAMPS; TELEVISION SETS

Sylvania Electric Products Inc.
1740 Broadway, Dept. L-3102, N. Y. 19, N. Y.
Please send me full details about Sylvania's big ad program for 1952.

Name_____

Company_____

Street_____

City_____ Zone____ State_____

MANUFACTURERS & MARKETS

Babcock & Wilcox Starts . . .

. . . operation of new extrusion facilities to produce seamless stainless steel tubing by French process

For the first time, seamless stainless steel tubing has been produced on the new hot extrusion facilities of the Tubular Products Division of Babcock & Wilcox Co at Beaver Falls, Pa., according to an announcement made recently by Luke E. Sawyer, vice president.

First in U. S. . . . The announcement revealed that the Babcock & Wilcox plant is the first in the United States, designed specifically to produce stainless steel tubing by the "Ugine-Sejournet" extrusion process, to be placed in actual operation. As far as the electrical industry is concerned, the process will have its greatest effect on boiler tubing.

Sawyer pointed out that the process makes it possible for the first time to extrude hollow and solid sections of metals which forge with great difficulty. The process also will make tubing available much faster and it will be more perfect and more efficient. It also permits much finer and more complicated sections than heretofore possible even with the more readily forgeable steel alloys. He said that the distinguishing feature of this extrusion method of producing seamless tubing is the use of glass to act for an extremely short time both as a lubricant for the hot worked metal and as an insulator to protect the die system.

License Agreement Consummated . . . Babcock & Wilcox first announced its intent to produce tubing by the "Ugine-Sejournet" extrusion process in mid-1950 upon the completion of a licensing agreement with Comptoir Industriel d'Etirage & Profilage de Metaux of Paris, France, developers of the process and holders of patent rights.

The first "lot" of extruded seamless tubing produced by Babcock & Wilcox was B&W Croloy 18-8S, an 18% chromium 8% nickel stainless steel alloy, Sawyer stated. The extruded tubes were subsequently "Roto-Rocked." The choice of stainless steel for the first lot of tubes produced by extrusion was felt by the company to be appropriate since it was back in 1922 that Babcock & Wilcox produced the first seamless stainless steel tubing in the U. S.

Payment Policy Altered on GE Heavy Apparatus

General Electric Co has modified a long-established "terms of payment" policy on heavy electric apparatus. The percentage of the contract price covered by progressive payments during the manufacturing cycle of the apparatus has been increased from 50 to 80%. The payments will apply to all contracts in excess of $250,000 and will continue to be made in equal monthly installments during the manufacturing cycle.

The apparatus affected includes turbine driven equipment, power transformers, large switchgear, and substation equipment.

Purchases Illinois Firm

Illinois Electric Porcelain Co, Macomb, Ill., has been purchased by T. M. Evans, president of H. K. Porter Co, Inc, Pittsburgh, Pa., as a personal investment. E. M. Skipper has been elected executive vice president and general manager and will be in charge of all operations at the plant in Macomb. M. E. Roark will continue as vice president and sales manager. C. H. Commons, Jr, formerly of General Electric Co, will be manufacturing manager.

Westinghouse Turbine Output to Set Record

Westinghouse Electric Corp's Steam Division at Philadelphia, Pa., plans to produce the greatest volume of power-generating steam turbines in its history during 1952. This production will help supply vitally needed electric power for the nation's defense effort.

The division expects to ship this year 3 million kw of turbine capacity, which is nearly 100% above last year's record-breaking figure and four times the company's best pre-war steam turbine production.

"Present orders call for production of steam turbines and their associated equipment during the next three years at average annual rates 3½ times as high as our best pre-war year," D. W. R. Morgan, vice president of the company, declared recently. Meeting this schedule will, of course, depend largely upon a satisfactory allocation of certain raw materials by government authorities in Washington."

Steam turbines driving electric generators produce nearly two-thirds of all the electric power generated in the United States. Units range in size from 1,000 kw models to goliaths which will continuously pour out 200,000 kw.

Prior to World War II, the Steam Division normally employed 3,000 people. Since the war, the division has spent several million dollars on enlargement and rearrangement of the plant which has increased the number of employees to approximately 6,000. During 1952 it is expected there will be a greater number of employees at the plant.

MANUFACTURING BRIEFS

Burndy Engineering Co, Inc, manufacturer of electrical connectors, has moved into its recently completed 48,000 sq ft administrative headquarters building at Norwalk, Conn. The new, one-story brick-and-steel building, which occupys a ten-acre tract, houses 300 office employees formerly located in New York and the quality-control and research laboratories.

Delta-Star Electric Co, a division of H. K. Porter Co, Inc, has announced plans for a $500,000 plant expansion program. The expansion plan calls for the construction of extensions on both the north and south ends of the main Chicago factory. It will provide an additional 30,000 sq ft for manufacturing facilities.

General Electric Co has made available to electric utility representatives a new slide film entitled "Invisible Battalions." The 15-minute presenta-

tion describes the significance of electric power in our defense economy.

Reynolds Metals Co has issued a letter of intent to C. F. Braun & Co, Alhambra, Calif., for the engineering and construction of a $42-million alumina plant in San Patricio County, Tex. The plant, scheduled for completion by January, 1953, will be built adjacent to the company's aluminum reduction plant under construction. It will employ about 600 workers.

Aluminum Co of America has registered $125 million debentures with the Securities and Exchange Commission. Alcoa, which is also arranging to borrow an additional $100 million from banks, will use the proceeds of the issue to cover part of the financing of its current expansion program.

Westinghouse Electric Corp's intensive three-month iron and steel scrap drive has boosted the nation's dwindling stockpile nearly 5,500 tons. The amount collected was in addition to the company's regular scrap savings of about 29,000 tons during the same period.

SALES ASSIGNMENTS

COMPANY STAFFS

Highway Trailer Co, Edgerton, Wis., has appointed R. E. Templeton as its central regional manager. Templeton, who joins Highway after several years with Gramm Trailer Corp, will make his headquarters in Cincinnati at 2150 Colerain Ave. He will serve the area including Ohio, Michigan, Indiana, western Pennsylvania, West Virginia, and Kentucky.

General Electric Supply Corp has announced promotions for three members of the Dallas district office. R. Jackson West, former Dallas district manager, has been named district manager of the Los Angeles territory. John C. McKee, former assistant appliance sales manager, has been named Fort Worth branch manager. Howard D. Peacock, former Atlanta, Ga., district sales manager, has been appointed Dallas district manager.

Westinghouse Electric Corp has appointed James P. Peterson manager of its Johnson City (N. Y.) office. Peterson, an application engineer who joined Westinghouse in 1941, was assigned to the Binghamton-Johnson City office in 1946.

BullDog Electric Products Co, Detroit, Mich., has named Louis H. Hopper assistant Eastern Division manager. Hopper, who was promoted from New York district manager, will make his headquarters at 101 Park Ave., New York 17, N. Y. G. P. Koenig will fill the New York district manager's position vacated by Hopper. Koenig will also make his headquarters at the New York address.

NEW ELECTRICAL CONSTRUCTION

A weekly selection of U. S. electrical construction projects announced by private and government utility systems involving more than $70,000. Also listed are major industrial and construction jobs where electrical work is indicated or implied

UTILITIES

Proposed Construction

California — Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Sacramento, circuit breakers, disconnecting switches, etc. for Olivetta Substation, Central Valley Proj., Spec. DS 3666. R. N. McClellan, co. engr.

Florida—West Florida Electric Cooperative Assoc., Graceville, 96 mi. rural distr. line and sys. imprvs., Jackson Co. $415,000.

Ia., Waverly—City, Sect. 2, building work, covering equipment for foundations, building alterations for installation of diesel generating equipment. Stanley Eng. Co., Hershey Bldg., Muscatine, engr.

Mich., Kalamazoo—State, A. N. Langlois, dir. State Bldg. Dpt., Lansing, power plant imprv., constr. electrical distr. sys., second sect. Kalamazoo State Hospital, Fargo Engineering Co., 120 W. Michigan Ave., Jackson, engr.

Minnesota—Northern States Power Co., B. F. Hraneey, pres., 15 N. 5 St., Minneapolis, 115,000 volt, 55-mi. electric transmission line between St. Cloud and Coon Rapids, $1,250,000-$1,500,000.

Missouri—Southwestern Power Admin., Petroleum Bldg., Tulsa, Okla., 13 mi. 66 kv transmission line from Swiss to Herman, $125,000.

Nebraska—Niobrara Valley Electric Membership Corp., O'Neill, 240.28 mi. rural distr. lines, Boyd, Holt and Wheeler Counties. Plans deposit $10. Philip L. Burns, 630 Davenport Bank Bldg., Davenport, Ia., consult. engr.

Nebraska — McCook Public Power Dist., McCook, rural distr. lines, sys. imprvs., Red Willow Co. - $305,000. P. L. Burns, Davenport Bank Bldg., Davenport, Ia., consult. engr.

N. C., Cherry Point—At office Resident Officer in Charge of Construction, Marine Corps Air Station, alterations, addns. to commissary butcher shop and cold storage room in Bldg. 162, NOY 29673, Spec. 31373. Plans deposit $10.

Oklahoma—Oklahoma Gas & Electric Co., 321 N. Harvey St., Oklahoma City, Zone 2, 35 mi. 66 kv transmission line from Enid to Guthrie, Garfield Co. $400,000; 25 mi. 66 kv transmission line from Harrah to Meeker, Oklahoma Co. $200,000; 20 mi. 66 kv transmission line from Edmond to Guthrie, Oklahoma Co. $175,000. R. F. Danner, c/o owner, engr.

Oklahoma—Verdigris Valley Electric Co-operative, Collinsville, 219 mi. rural distr. lines, near Collinsville, Tulsa Co. $90,000. E. R. Taylor & Co., 4167 E. 11 St., Tulsa, engr.

South Dakota—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Sioux Falls, outdoor-type, power transformer; outdoor, power circuit breakers; outdoor, horn-gap switches; outdoor disconnecting switches for Sioux Falls Sub-station Transmission Div. Missouri River Basin Proj. Inv. No. DS-3651.

South Dakota—U. S. Eng., 1709 Jackson St., Omaha, Neb., aerial power lines at Fort Randall Reservoir Proj., Inv. 59-75.

Texas—Swisher County Electric Cooperative, Tulia, 75 mi. rural distr. lines and sys. imprvs., Swisher Co. $112,000.

Tex., Dallas—Southwestern Electric Service Co., Mercantile Bank Bldg., transmission line, extens., imprvs. $295,000; distr. lines, $250,000.

Tex., Dallas—Southwestern Electric Service Co. Mercantile Bank Bldg., plant imprvts. $175,000.

Washington — Clallam Co. Public Utility Dist., Port Angeles, 69,000 volt power transmission line from Port Angeles to Forks, Clallam Co. $650,000. W. S. McCrea, Jr., Perkins Bldg., Tacoma, consult. engr.

Wash., Fort Lewis—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, electrical distr. system for permanent troop facilities, ENG 45-108-52-140. $175,000.

Wash., Spokane—U. S. Eng., City-County Airport, Walla Walla, electrical distri. system at sub parking areas, Fairchild Air Force, $375,000.

Low Bidders & Contracts Awarded

Ga., Decatur—Flagler Co., 305 Techwood Dr., Atlanta, Ga., CA, Approx. $150,000, warehouse. Georgia Power Co., Marietta St. N. W., Atlanta, Ga. Bids Jan. 15.

Idaho — Pennsylvania Transformer Co., Cannonsburg, Pa., LB, $216,870, three 13,500 kva-3-phase power transformers for Albeni Falls Dam. Inv. 52-22, Priest River. U. S. Eng., 47353 E. Marginal Way, Seattle, 4, Wash. Bids Jan. 29.

Ky., Ford—Glazer Steel Corp., 2100 Albor Ave., Knoxville, Tenn. LB $139,483, structural steel for R.E.A. generating plant. East Kentucky Rural Electric Co., Operative Corp., Winchester, Ky. Bids Jan. 30.

Minnesota—Kehne Electric Co., 722 Raymond Ave., St. Paul, Minn. $66,789, street lighting, traffic signals in Minneapolis on Hiawatha Ave. between 8 and 24 Sts., Cedar Ave. between 24 St. and Minnehaha Ave., East Franklin Ave. between 18 and Snelling Aves., State Hy. Dpt., 1246 University Ave., St. Paul, Minn. Bids Jan. 18.

Tex., Carthage—Southwestern Gas & Electric Co., Longview, Tex., Own Forces, $95,000. Sub-station expansion and imprvs.

Tex., Gladewater—Southwestern Gas & Electric Co., Longview, Tex., Own Forces, $110,000. Sub-station expansion and imprvs.

INDUSTRIAL, COMMERCIAL & PUBLIC BUILDINGS

Proposed Construction

Kan., Manhattan—State Bd. Regents, Topeka, plans by C. L. Marshall, state archt., Topeka, student union bldg., Kansas State College, $1,500,000.

La., Shreveport—Ralston Purina Co., 825 S. 8 St., Louis, Mo., plant, $1,000,000.

Me., Lewiston—St. Mary's General Hospital, 318 Sabattus St., hospital addn., Sabattus St. $1,300,000. Stanley S. Merrill, 9 Vine St., Auburn, archt.

N. J., Trenton—Owner, c/o Agent Hyman Rothbart, 342 Madison Ave., New York, N. Y., apartment. Wert and Olden Aves., in Hamilton Twp., Approx. $2,000,000.

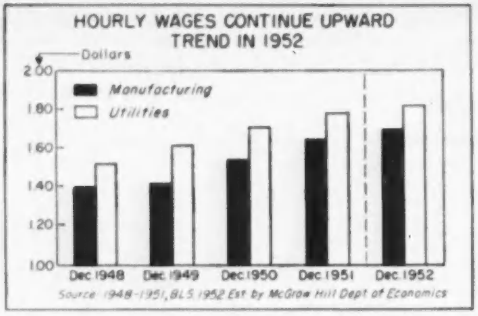
Pa., Ligonier—School Dist. Legonier Two., Ligonier plans by Robert J. Brocker, 201 Coulter Bldg., Greensburg, 2 story, brick, block consolidated Grade and Junior High School $1,000,000.

Pa., Ross Twp.—Philip Reicher & Assoc., 2271 Shady Ave., Pittsburgh, 100,000 sq. ft. shopping center, near Pittsburgh, Perry Hy. $1,000,000.

Tex., Houston—Reichhold Chemicals, Inc., c/o Henry M. Reichhold, 601 Woodward Heights, Ferndale, Detroit, Mich., chemical plant mfg. phenol resins and phenol plastic products, $3,250,000; earthwork, grading, drainage, $75,000; road, street constr., and paved plant areas on Ship Channel, $90,000.

Ont., Cooksville—Benamin Pass. c/o Harold A. Clark, Ltd., 22 Lake Shore Rd., Toronto, apartment, 45 two and three story, structures on 4[9] acre site at Dixie Rd. and near Queen Elizabeth Way. $7,000,000.

ELECTRICAL BUSINESS OUTLOOK



Wages Will Rise in '52

For utilities this means higher prices for labor, construction, fuel, and materials

There's a pattern being shaped for 1952 wages. But it will be some time before you see it clearly. Wage stabilization rules are slowing down the process. Look at steel. And they also mean it won't work the same in every industry.

But you can get a hint now of what's coming up. The steel settlement is likely to run to 15 to 20¢, including fringe benefits. This will be partly to help steel workers catch up with other workers. Their wages have been fixed since December 1950.

The steel pattern will have an important influence on what happens in the coal industry. The miners usually do as well as the steel workers—sometimes better. And this year coal mining is prosperous enough to pay the increase.

Effect of Escalator Clauses . . . More important for industry generally will be the amount of increases paid under escalator formulas that follow the cost-of-living index—the so-called GM formula. Most of these contracts also allow about 4¢ per hour as a yearly reward for higher productivity.

Best guess now is that industries operating under the GM formula will raise wages about 10¢ per hour during 1952: 4¢ for productivity, about a nickel to keep pace with living costs, and maybe an extra cent or two for fringes.

The average wage increase granted in manufacturing won't match that granted by the leaders in the steel and motor industries. Many small companies aren't so well set to pay increases. Some industries, like textiles, are even considering wage cuts. And wage stabilization will delay many adjustments. The average boost for all manufacturing will probably be around 6 or 7¢ per hour.

Workers in the power industry are likely to do at least this well, judging by the trend of recent contract adjustments and by the usual tendency of utility wages to keep up with or better manufacturing pay scales. Since there may also be an increase in overtime payments and fringe benefits this year, utility wage costs will definitely be up.

Utilities Will Be Affected . . . Of course, utilities will also feel—indirectly—the effect of wage increases paid in industries like steel, coal, and electrical manufacturing. They will show up in increased prices for equipment and supplies. But in this case, the full effect may be considerably delayed.

Some manufacturers will have to wait for OPS sanction before they can pass along the increased costs. And the delay may run into months. Also a good part of utility needs for fuel and equipment comes under long-term contracts. Such prices won't change before 1953.

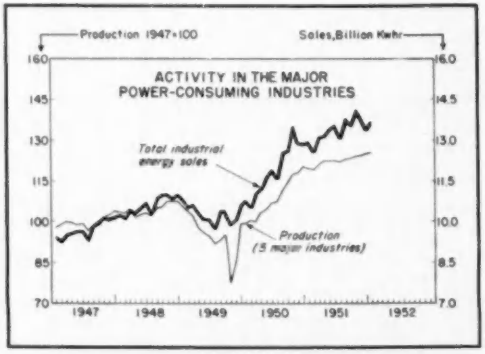
Actually, these indirect cost increases are more important to the power industry than the direct increase in its own labor costs. So you might say the main effect of "cost-push" inflation—which happens to be mostly labor push in 1952—will hit the power companies about a year from now.

The Big Problems of 1952 . . . Costs—not shortages—and labor—not materials—are going to be the big problems as 1952 gets on. You can see that from some recent announcements about materials:

1. United States Steel's commercial research department says that steel is definitely getting easier and that some products, but not structurals, will be in oversupply later this year.

2. NPA is reallocating to civilian manufacturers some of the aluminum it had set aside from military production in the second quarter. The military had way too much in the light of revised production schedules.

This is a tip-off that civilian allocations of aluminum are likely to be raised again in the third quarter. And that would go a long way toward easing the copper shortage.



A Statement by Anaconda on the Copper Situation

MANY users of copper have vital decisions to make . . . usually in connection with the present defense-induced shortages of copper and aluminum. This statement is an effort to remove the smoke screen surrounding the copper picture . . . to wipe away the confusion caused by too much talk supported by too few facts.

Substitution poses problems – Industry has been urged to substitute aluminum and other materials for copper. In some instances this may be logical and practicable. In many others it is difficult, if not impossible. But – before making *any* long-term decisions that may cost a great deal of money in engineering, new plant facilities or rescheduling of production operations – one should know the facts about the future of copper.

New Anaconda projects – The first major increase in copper production will come from Anaconda when the Greater Butte Project and the new Sulphide Plant at Chuquicamata, Chile, begin operations this spring. By 1953, these two projects should raise present levels of copper production by about 95,000 tons yearly.

Toward the close of 1953, Anaconda's new Yerington project in Nevada is expected to start producing at an annual rate of 30,000 tons. By then, Anaconda will be adding to the present yearly copper supply at the rate of about 125,000 tons.

Other new projects – During 1954-55 still other new projects in the U. S. and friendly foreign countries will further augment the increasing copper supply. All told, it is estimated that by 1955, not less than 450,000 tons of copper could be produced annually – over and above present production levels.

Accordingly, in 1955-56, domestic production plus imports could bring the U. S. copper supply to 1,800,000 tons yearly. This would represent an increase of about 20% over present levels. Based on historical comparisons, and barring a large-scale shooting war, this amount of copper could support a Federal Reserve Board Index of Industrial Production of 270, an increase of 24% over the present, and 45% above the first half of 1950.

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These are the 'things to come' in copper. On the basis of the facts there is no necessity for considering long-range substitution of other materials for the red metal.

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ANACONDA
COPPER MINING COMPANY

The American Brass Company
Anaconda Wire & Cable Company
International Smelting and Refining Company
Andes Copper Mining Company
Chile Copper Company
Greene Cananea Copper Company

PRODUCERS OF: Copper, Zinc, Lead, Silver, Gold, Cadmium, Vanadium, Superphosphate, Manganese Ore, Ferromanganese.

MANUFACTURERS OF: Electrical Wires and Cables, Copper, Brass, Bronze and other Copper Alloys in such forms as Sheet, Plate, Tube, Pipe, Rod, Wire, Forgings, Stampings, Extrusions, Flexible Metal Hose and Tubing.

When feeder loads increase WHY SACRIFICE RANGE OF REGULATION?

Vari-Amp Feature on the DFR Regulator permits operation at 5 ranges of regulation — instead of cutting ranges in half when loads increase.

ON MANY FEEDER LINES where loads are increasing, range of regulation has been sliced in half. Increase in load has forced halving regulating range because some types of regulators have a series-parallel winding that provides only two possible ranges. As a result, even with increased loads, revenues have not risen in proportion.

These revenue losses aren't necessary. When Allis-Chalmers DFR 5/8% step regulators equipped with the *Vari-Amp* feature are on the line, five current ratings and corresponding ranges of regulation are available. When loads are increased, range of regulation can be decreased slightly — it doesn't have to be cut in half.

For example, a 200 ampere DFR regulator with the *Vari-Amp* feature could be operated at any of the following ratings:

200 amps — 20% range	267 amps — 17½% range
229 amps — 18¾% range	320 amps — 16¼% range
400 amps — 15% range	

Easy to Adjust Ratings

Best of all, large savings in man-hours are made possible by the *Vari-Amp* feature on the DFR regulator. Unlike other types of regulators, the DFR needn't be bypassed or disconnected for adjustment. There are no electrical connections to change. No taping. One man can make the change in minutes merely by opening the position indicator window and changing two limit switch pins. A-3592

Vari-Amp is an Allis-Chalmers trademark.

GET THE COMPLETE STORY

Allis-Chalmers DFR 5/8% step voltage regulator with *Vari-Amp* feature gives you all the advantages of the 5/8% step regulator: 20% range of regulation, ± 1 volt band, greatly simplified maintenance and long-life contacts. In addition, there is no danger of hunting or overshooting. Get the complete story of the DFR regulator from your nearest Allis-Chalmers district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Originators of 5/8% Step Regulation